

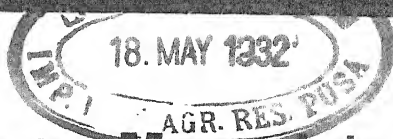






IMPERIAL INSTITUTE  
OF  
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# Valentine's Meat-Juice

In all **Wasting, Acute** or **Febrile Diseases**, where the **Digestive Organs** are **Impaired**, **Valentine's Meat-Juice** demonstrates its **Ease** of **Assimilation** and **Power** to **Sustain** and **Strengthen**

## When Other Food Fails

The quickness and power with which **VALENTINE'S MEAT-JUICE** acts, the manner in which it adapts itself to and quiets the stomach, its agreeable taste, ease of administration and assimilation, have won for it the approval and endorsement of many medical men of Europe, America, etc.



**VALENTINE'S MEAT-JUICE CO.**

**RICHMOND, VIRGINIA, U.S.A.**

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Trade  
Mark**'Neotropin'** Brand

Butyloxy-diamino-azo-pyridin.

**A URINARY ANTISEPTIC AND  
GENERAL INTERNAL DISINFECTANT.**

Remarkable power of penetration,  
and tissue affinity, are the funda-  
mental factors of its effectiveness in

**PYELITIS, PYELONEPHRITIS,  
CYSTITIS,  
GONORRHOÆAL AFFECTIONS, Etc.**

Bottles of 30 and 250 dragées (1·5 grains).

Dosage: 1-2 dragées three times a day.


**An Analgesic**

of pronounced value in the  
*symptomatic* treatment of Men-  
strual Pain, etc. Induces rapid  
and protracted analgesia with—  
in therapeutic doses—no toxicity  
or carry-over effects

**Tablets—Powder**


**An Hypnotic**

which induces restful, refreshing  
sleep resembling the natural, in  
all forms of Insomnia. Its ready  
solubility implies rapid effect and  
speedy elimination, with freedom  
from secondary symptoms.

**Tablets—Powder—Cachets**

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**BRAND**

**THE HANDIEST FIRST-AID IN THE WORLD**

Nothing more convenient for Doctors and Nurses. 200 applications or more in a tube.

The "Pen" contains B.P. Tincture of Iodine in a glass tube with a rubber-washed metal cap, all contained in a neat screw-capped nickel-plated case measuring 3 in. by  $\frac{1}{2}$  in. diameter. Convenient to use for sterilising before hypodermic injections. Saves a septic scratch or cut.

Can be carried in pocket like a fountain pen with clip, or loose in bag. No fear of breakage, waste or leakage.

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The IODINE "PEN" is also obtainable in a self-filling vulcanite model, price 1/8 post free. **SPECIAL PRICES for HOSPITALS**

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A new technique in the  
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The "Canda" Patent  
 Nasal Bottle containing

**EPHEDROL**



Simply insert nozzle in nostril,  
 throw head back and 'sniff.'

has been reported on and endorsed by leading Laryngologists as being equal in efficiency to any atomiser spray or nasal douche, while it is superior in cleanliness, convenience and freedom from leakage. Ephedrol contains Ephedrine 1.0, Camphor 2.0, Menthol 2.0, Aromatic Oil q.s., Neutral Oil ad 100. CANDOL, a similar preparation but without the Ephedrine content, is also supplied in the patent "Canda" bottle.

*Literature and special prices for quantities sent on application.*

**PRICES**—EPHEDROL, 1 oz. in patent bottle, 3/—, post free 3/3. CANDOL, 1 oz. in patent bottle, 2/—, post free, 2/3.

Registered



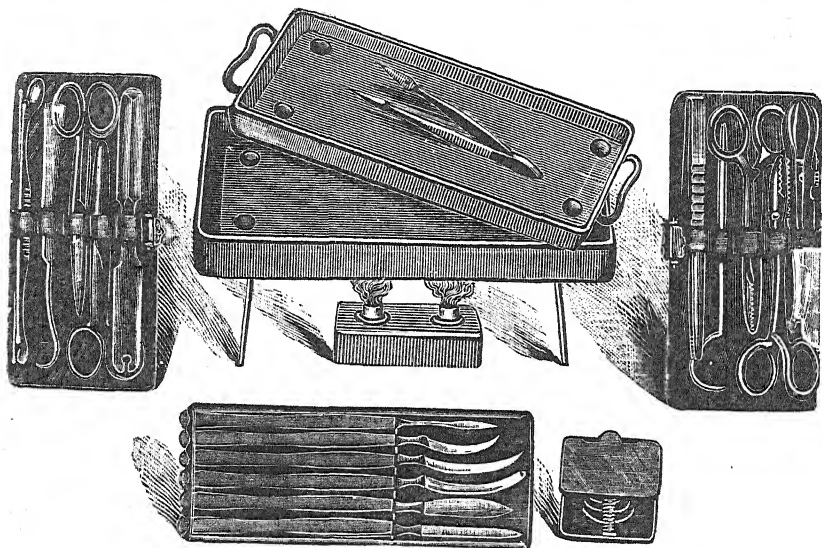
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# ASEPTIC MINOR OPERATING INSTRUMENTS

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## SEAMLESS METAL CASE STERILIZER.



**A**LL the Instruments are strictly aseptic, and of the highest finish. The Knives, of the best English make, are forged out of solid steel.

When not in use the Instruments lie on electro-plated trays in the metal case or sterilizer, which is enclosed in an outer case, the dimensions being 8 by 3 inches.

The Metal Case or sterilizer is seamless, being stamped out in one piece, and electro-plated. It is supplied with Stand and Lamp.

The following is a list of contents :—

Needle Holding Forceps  
Straight Aseptic Dressing Scissors  
Curved ditto ditto  
Splinter Forceps  
Combined Spatula and Tongue  
Depressor, with Frænum Slit  
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Double Volkman's Spoon  
Director and Aneurism Needle  
Two Probes  
Six Operating Knives  
Needle Case with six Needles

*Price for the whole set complete - £4 4s. 0d. nett.*

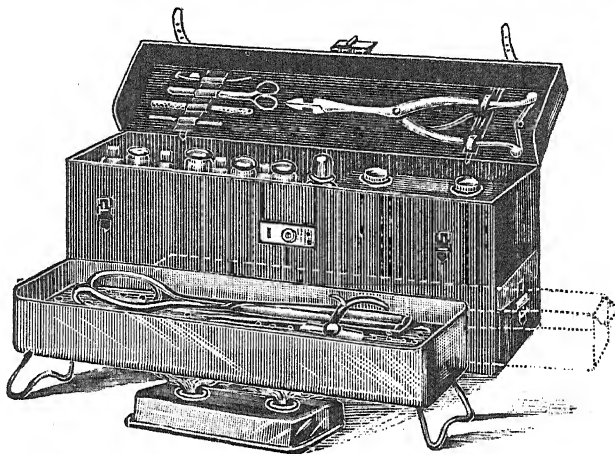
*(Export Price - £4 8s. 0d. Postage Paid.)*

SUBJECT TO MARKET FLUCTUATIONS.

## R. SUMNER & CO. Ltd.

Surgical Instrument Makers, LIVERPOOL.

# MODERN AND IMPROVED **MIDWIFERY BAG** **WITH STERILIZER**



**THE BAG** is made of cowhide (either black or brown) and has a compartment beneath into which the Sterilizer fits.

**THE STERILIZER** has no seams, being blocked out in one piece from a solid metal sheet and heavily nickel plated.

The larger instruments are carried in Sterilizer, the top portion of the bag being reserved for Nail Brush, Lamp, Chloroform Bottle, Pill and Medicine Bottles, Dredger, leaving room for Apron, Gloves, &c.

The inside Cover has loops arranged for carrying the smaller instruments.

**PRICE** of the bag, together with **STERILIZER, LAMP, NAIL BRUSH** and **SOAP** IN CASE, **MINIM MEASURE** IN CASE, **CHLOROFORM DROP BOTTLE** IN CASE, **DREDGER, 3 PILL BOTTLES, 3 MEDICINE BOTTLES** IN PLATED CASES:—

**£6 17s. 6d. nett** (or **£7 12s. 6d. in Brown Leather**).

An outside Canvas Cover can be supplied at 15/9 extra nett.

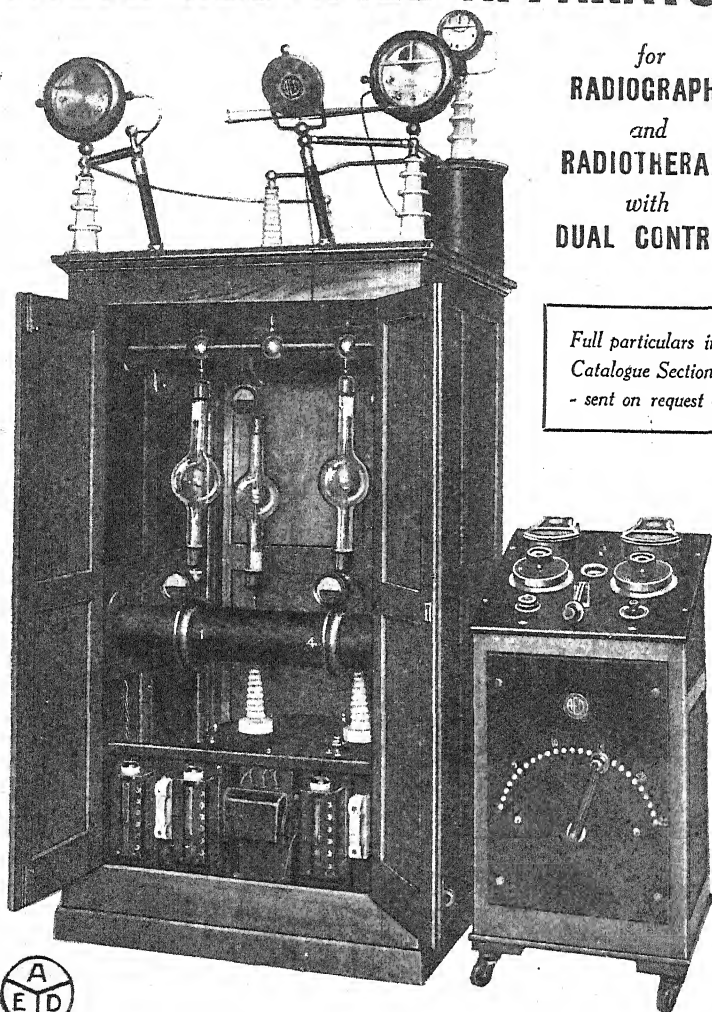
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for  
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*Full particulars in  
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We manufacture a full range of Transformers with Valve Rectification, and from reports received upon their performance, have no hesitation in offering them with our usual guarantee of absolute reliability and complete satisfaction to the user

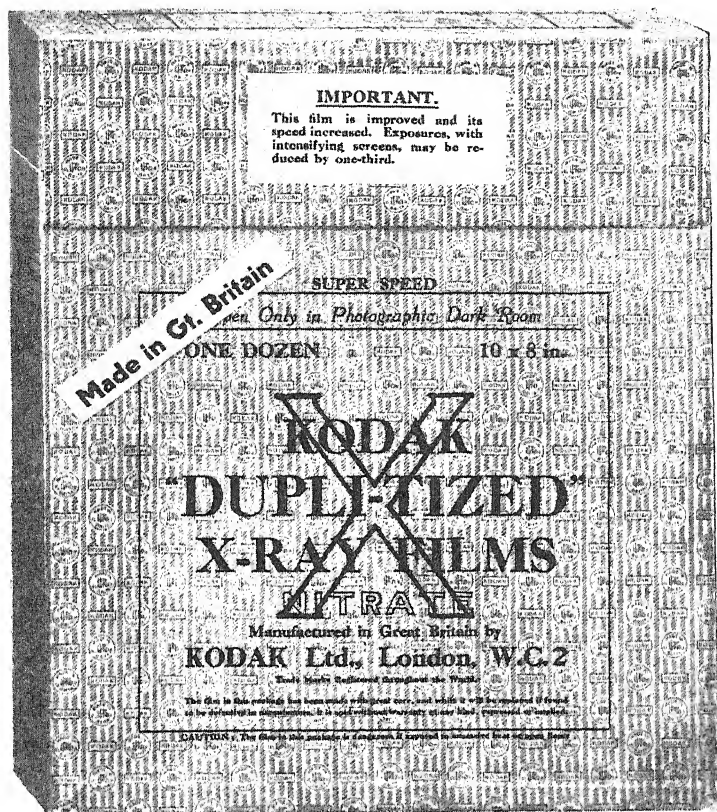
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Manufacturers of all types of X-Ray and Electro-Medical Apparatus of the Highest Grade

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# Kodak "Dupli-Tized"

## X-Ray Film, Super Speed

*—for reliable diagnostic quality*

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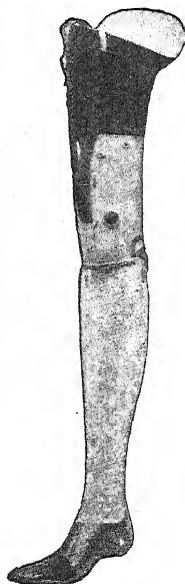
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We can supply a useful range of sets with interchangeable parts to suit individual needs at moderate charges.

All kinds of Ophthalmic  
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Our reputation for surgical appliances of all kinds, e.g., Leg Instruments, Spinal Supports in certalmid, poroplastic or metal, Caliper Splints, etc., grows steadily year by year. We welcome difficult cases, and in our well-appointed London fitting rooms we have every convenience for the comfort and treatment of patients.

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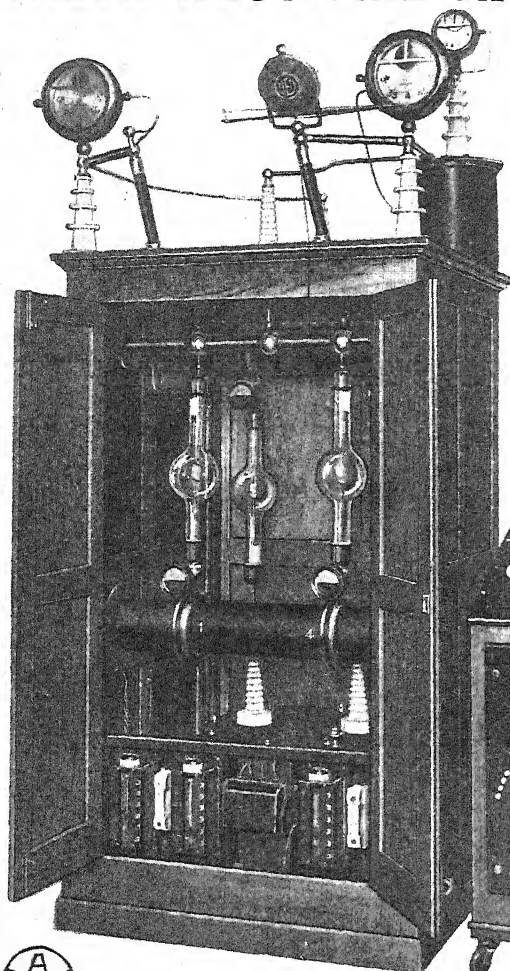
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Convertible Mortons Ophthalmoscope  
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Now :— £6 . 6 . 0
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Ophthalmoscope, Retinoscope, and  
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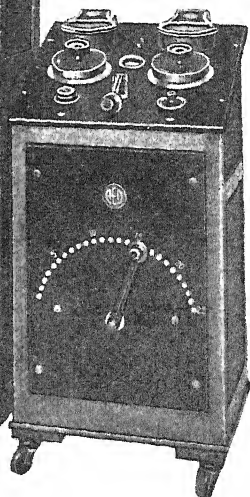
Personal Fittings given in all Cases.

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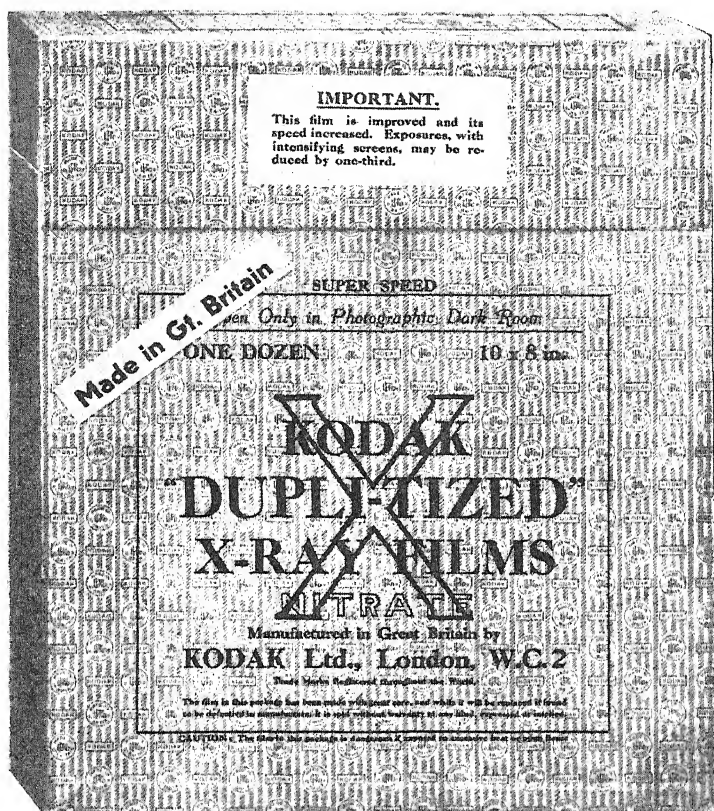
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## X-Ray Film, Super Speed

*—for reliable diagnostic quality*

Kodak Ltd. (Medical Dept.), Kingsway, London, W.C.2

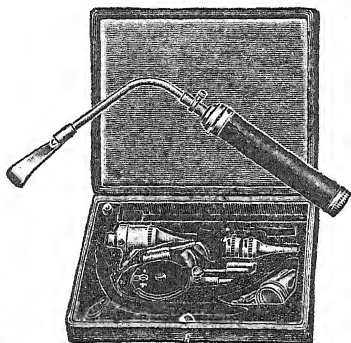
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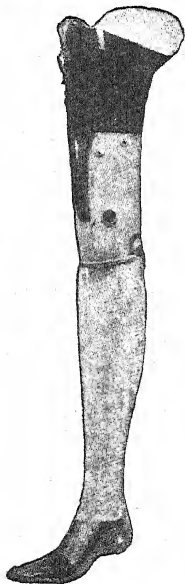
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We can supply a useful range of sets with interchangeable parts to suit individual needs at moderate charges.

All kinds of Ophthalmic  
Instruments supplied.

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OUR New Model Metal Leg still remains unsurpassed for lightness, strength and natural action. The ideal method of attaching this limb is by means of our "Surehold" hip joint and pelvic band, which is neat and light, gives the wearer universal movement, complete control over the limb, and enables shoulder braces to be dispensed with.

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We are prepared at the shortest notice to send an expert fitter to any part of England and Wales to take instructions and measurements.

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== *Spectacles* ==

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- \* The Miss Ida C. Mann  
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Personal Fittings given in all Cases.

## EPHEDRINE COMPOUND NASAL SPRAY (R. & B.)

*An oily Nebula for use in Nasal Catarrhal conditions. Of great value in Hay Fever, etc., leaving the inflamed mucous membrane soothed and comfortable.*

A Medical Practitioner writes as follows:

"I have occasion frequently to prescribe your 'Ephedrine Compound Nasal Spray,' with the greatest benefit in all catarrhal conditions of the nose and nasal sinuses. . . . It seems to me quite the best thing of that kind that has ever been produced."

A suitable all glass atomizer is supplied, the price of the outfit comprising solution and atomizer being 6/6.

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(R. & B.)

A most successful treatment for Hæmorrhoids. Besides Bismuth Subgallate they contain Zinc Oxide and Resorcin, and this has proved a really effective combination. The Suppositories are tinted to a uniform colour with a harmless vegetable compound. Where an ointment can with advantage be used along with these Suppositories, Ung. Sedativum will be found a valuable addition.

PRICE 1/6 dozen: 15/- gross.



## A BRITISH CATAPLASMA

showing a great advantage in price over similar foreign preparations

## SILCASINE (R. & B.) <sup>An</sup> ANTISEPTIC POULTICE

(Registered)



A COLLOIDAL SILICATE PASTE containing Boric Acid, Glycerine, Ammonium Iodide, Thymol, Menthol, &c.

Hygroscopic and antiseptic, it entirely supersedes the old-fashioned poultice in inflammatory and congestive conditions.

SILCASINE is non-irritating and non-toxic, and offers an effective method for the continued application of moist heat, maintaining the blood and lymph circulation in the affected part.

*Packed in hygienic aluminium containers with press cap.*

**REYNOLDS & BRANSON Ltd.**  
Telegrams: "REYNOLDS, LEEDS." **LEEDS.** Telephone: LEEDS 20047.



# A Safety Inhaler for Open Ether Administration

*Suggested by*  
**Dr. W. STANLEY SYKES**

*(Anæsthetist to the  
Leeds General Infirmary)*

Registered Nos. 753811-2

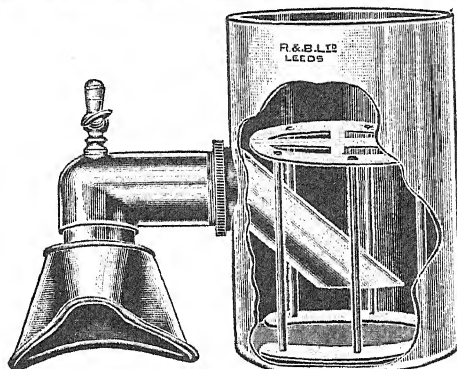
Ether cannot come in contact with the eyes or face.

## PRICES :

Inhaler, aluminium, complete with one Facepiece, £2 2 0

Additional Metal Facepieces :  
Large size for adult, small size for children, each 12/6

*Particulars on application.*



# LEDGER CARDS FOR MEDICAL BOOK-KEEPING

A Year's Record at a Glance.

CODE	VISIT	✓ CONSULTATION	✓ MEDICINE ONLY	✓ VISIT MEDICINE	✓ D
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TO BE LABEL BROUGHT FORWARD					
JAN. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31					
FEB. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29					
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DEC. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31					
DOCTOR'S REMARKS					
BALANCE FORWARD					

SPECIMEN ON APPLICATION.

## PRICES :

3/9 per - 100  
17/6 „ - 500  
34/- „ - 1000

Particulars of  
Filing Cabinets on request.

THESE Cards have the advantage of combining Day book, Ledger, and recording prescriptions or treatment on one card. A card is allotted to each patient, and by adoption of the simple code illustrated, a complete record of the year's account can be kept on one card.

The months can commence at any quarter, so that if a doctor makes up his books on, say June 30, he would order cards commencing with July as first month; or, if preferred, they may be had plain, i.e., without months or code.

They are stocked in three colours—White, Green, and Salmon.

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Telephone :  
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# **SURGICAL BELTS ALONE DEAL WITH THE ROOT CAUSES OF INTERNAL DISPLACEMENTS**

The mechanical engineering of the abdomen in cases of internal displacement is now the first concern of patient and physician. X-ray photographs reveal irrefutably that aperients and intestinal antiseptics are futile in such cases. The long and frequently disappointing records of surgical intervention of a formidable and dangerous kind, show clearly how little this form of treatment achieves. The medical profession is beginning to realise that the surgical belt—giving upward support—can alone deal successfully with the root cause of mankind's tendency to sag—the downward pull of gravitation.

Domen surgical belts are constructed to give ample upward support from the only anatomically legitimate foundation—the pelvis. And they do this without harmful pressure—without embarrassment to the patient. Domen belts are designed for specific complaints and are strong, durable and light. Full information will be sent on receiving your card or a telephoned request.

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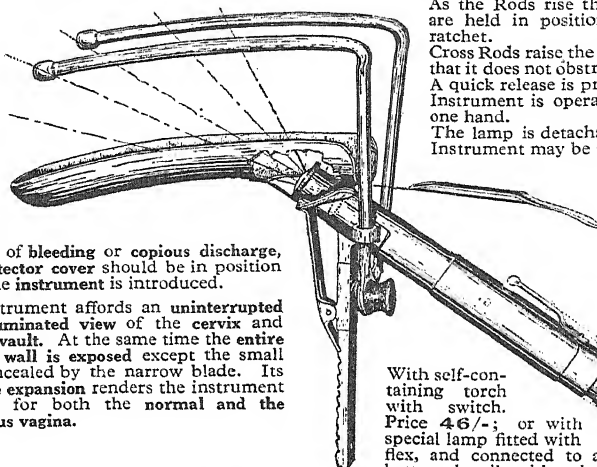
**DOMEN BELT CO. LTD., 26, SLOANE ST., LONDON, S.W.1**

Telephone: Sloane 3524

## Expanding Electric Vaginoscope.

British made. Patent No. 361581.

As suggested by JOHN HEWITT, M.B., M.C.O.G.



In cases of bleeding or copious discharge, the protector cover should be in position when the instrument is introduced.

The instrument affords an uninterrupted and illuminated view of the cervix and vaginal vault. At the same time the entire vaginal wall is exposed except the small area concealed by the narrow blade. Its variable expansion renders the instrument suitable for both the normal and the capacious vagina.

The two LATERAL EXPANDING RODS when raised distend and retract the ANTERO-LATERAL WALLS. As the Rods rise they separate and are held in position by a spring ratchet. Cross Rods raise the Bladder Wall so that it does not obstruct the view. A quick release is provided and the instrument is operated entirely by one hand. The lamp is detachable, so that the instrument may be sterilised.

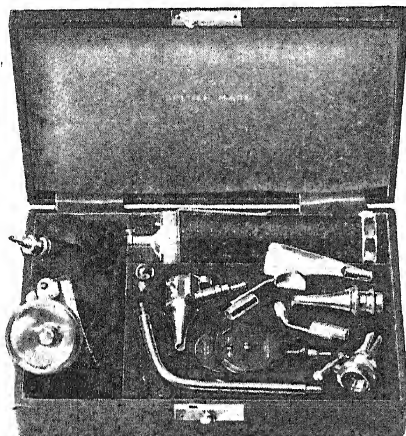
With self-containing torch with switch.

Price 46/-; or with

special lamp fitted with flex, and connected to a large capacity battery, handle with switch. Price 57/6

## New Clip Rheostat Diagnostic Set

for EAR, EYE, NOSE, THROAT and Obstetrical Work, Perineal Suture, Etc.



Improved Focusing Movement

May Ophthalmoscope

Electric Auriscope

Fitted with Daylight Bulb

1. MAY ELECTRIC OPHTHALMOSCOPE fitted with 24 Spherical Lenses—which permit the Fundus and Media of any eye to be minutely examined.
2. DAYLIGHT ELECTRIC AURISCOPE, fitted with three speculæ of different apertures, and Nozzle for inflation.
3. EXPANDING OPERATING NASAL SPECULUM. Fits into the Barrel of the Auriscope.
4. CURVED LARYNGEAL ROD, complete with two Boilable Throat Mirrors and Tongue Spatula.
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6. BATTERY HANDLE, with large capacity battery. Fitted with RHEOSTAT CONTROL and CLIP for fixing on the BREAST POCKET.

Complete in Velvet-Lined Case with 2 Spare Lamps - **£6 10s.**

With Expanding Electric Vaginoscope, Lamp, Flex and Plug - **£8 16s.**

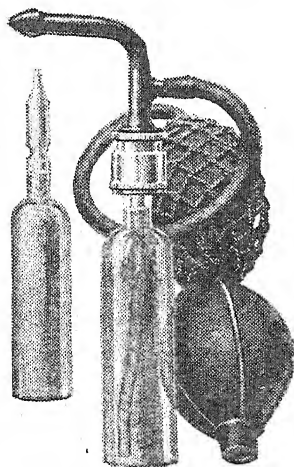
From all Surgical Instrument Makers.

**JOHN SMITH & SON (Glasgow) LTD.** Surgical Instruments & Appliances.  
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# THE TANNIC ACID TREATMENT OF BURNS

has hitherto been restricted  
owing to instability of solutions

**COLLOSOL TANNIC ACID 2.5%**  
in hermetically sealed ampoules applied by



## THE COLLOSOL SPRAY ADAPTOR

WILL ENSURE THE  
IMMEDIATE AND EFFECTIVE  
APPLICATION OF  
UNALTERED STABLE SOLUTION.

Instantly alleviates pain,  
thereby minimising shock.

Interchangeable from one ampoule to another.

**Spray complete with one ampoule :—**

In Metal Box - 9/-      In Cardboard Box - 7/6

**Refills :—** 6 × 30 c.c. ampoules - 5/-

3 × 30 c.c.      „      - 3/-

*Full particulars on application.*

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(British Colloids Ltd.)

**PARK ROYAL,**

**LONDON, N.W.10**

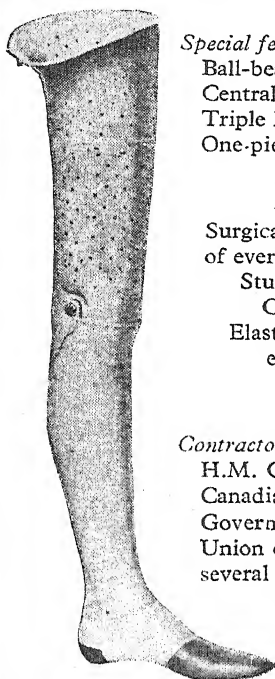
Telephone :  
**WILLESDEN 6313.**

Telegrams :  
**COLLOSOLS, HARLES, LONDON.**

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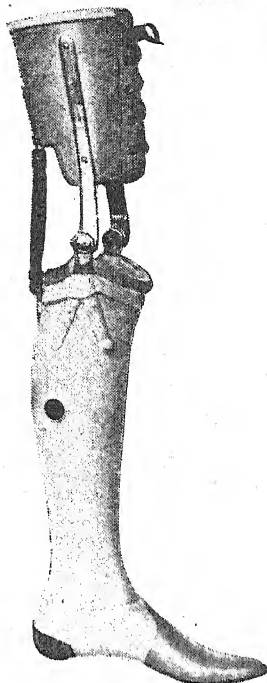
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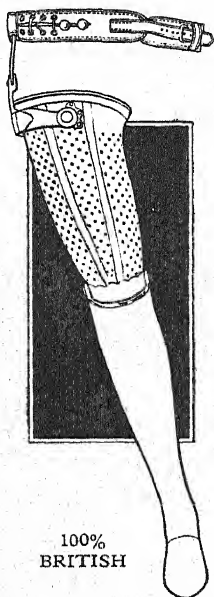
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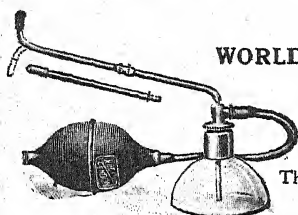
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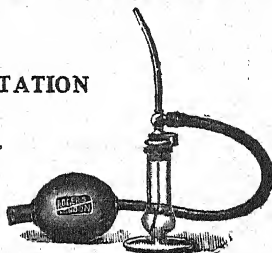
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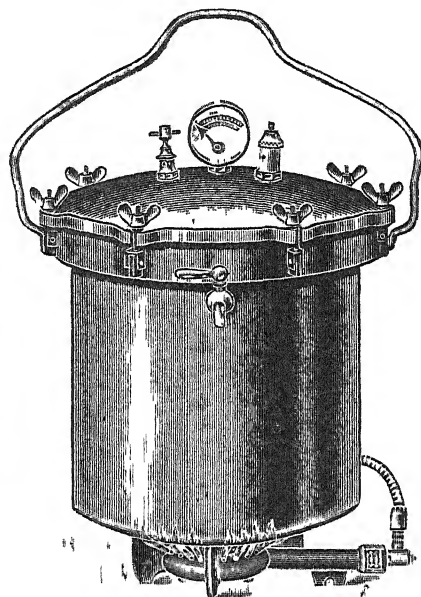
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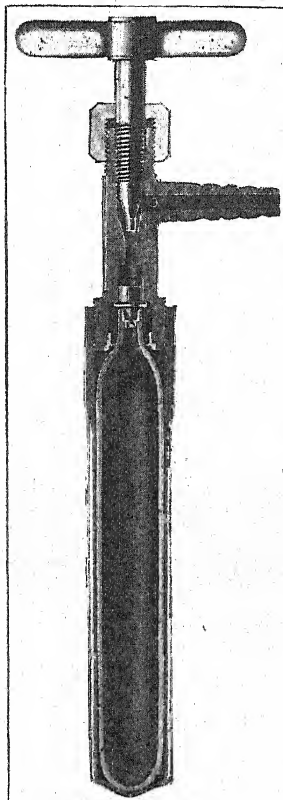
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Obviates the use of any weights, pulleys, or uprights, and does not pin down the patient when extension is applied to a limb.

*Particularly useful in the transportation of cases of Fractured Femur.*

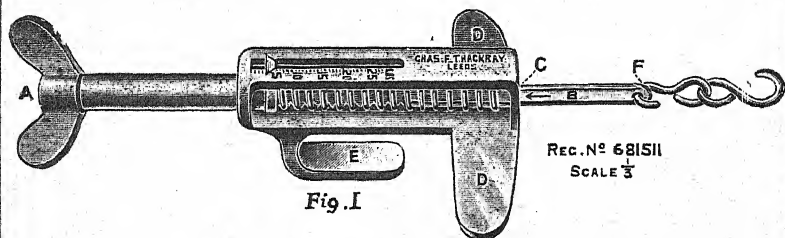


Fig. 1

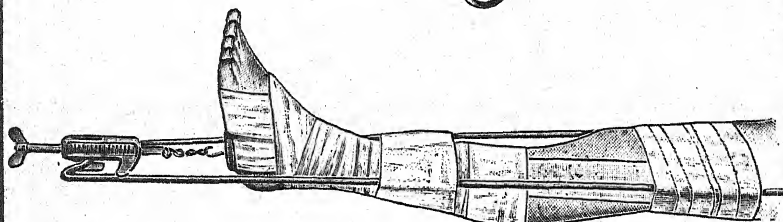


Fig. 2

**T**HE Bandaging in the illustration (Fig. 2) is arranged to show the limb with the extension applied to a Jones's or Thomas's Knee Splint.

An ordinary stirrup of webbing with a wooden block, through the centre of which is fixed a metal hook, is first applied to the limb by means of strapping. By means of this appliance, extension up to 25 lbs. can be applied to a limb, the amount of extension being registered on the scale.

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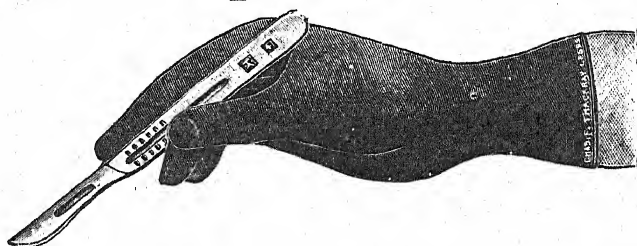
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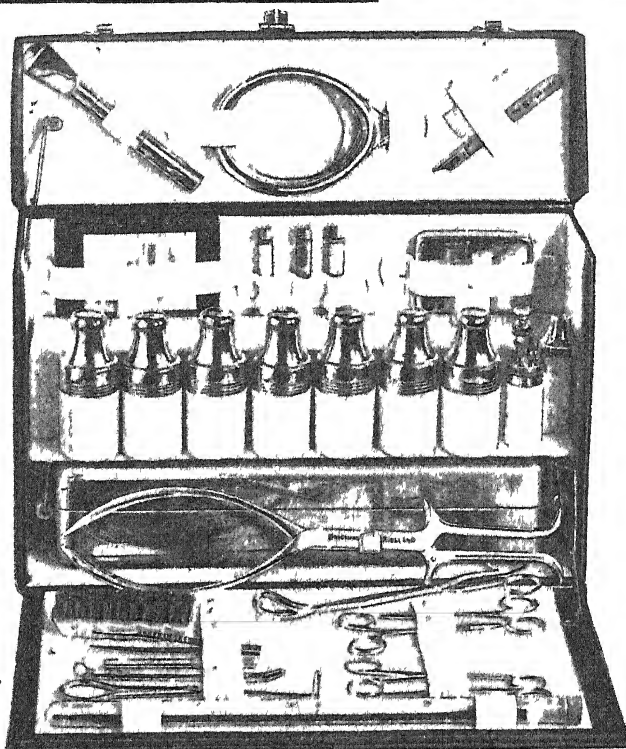
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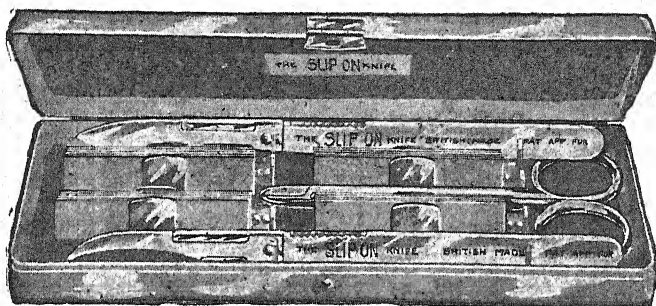
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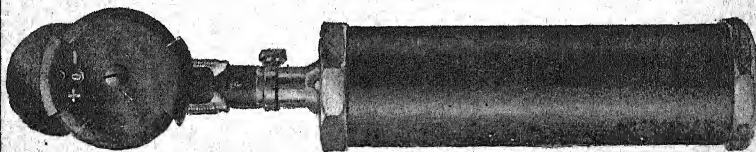
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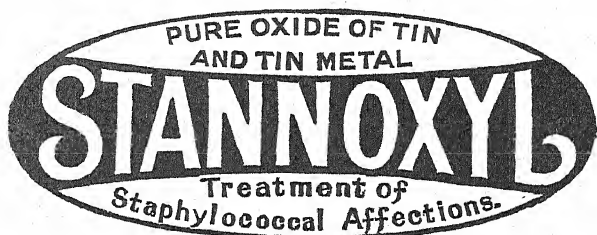
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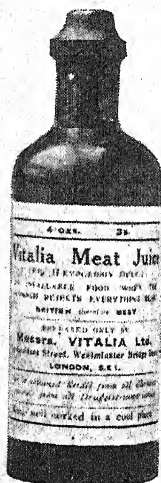
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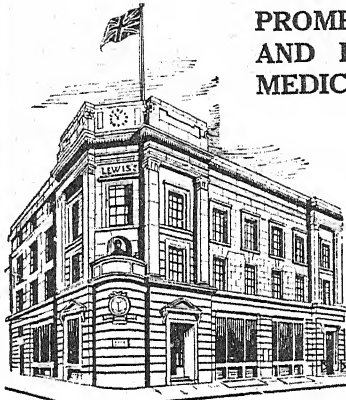
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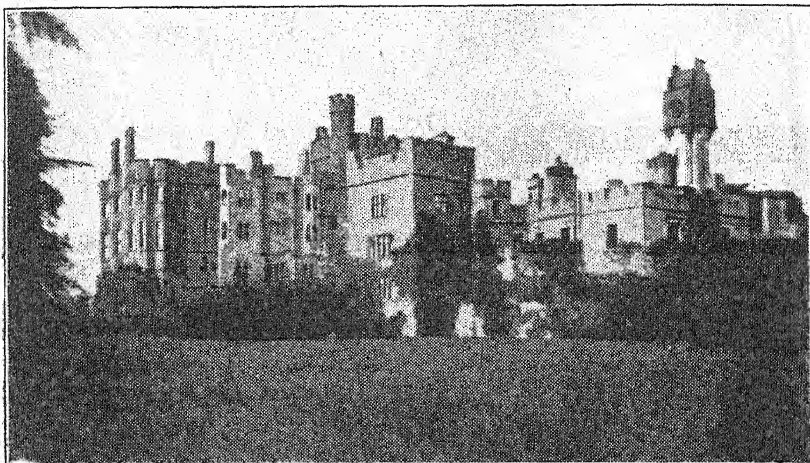
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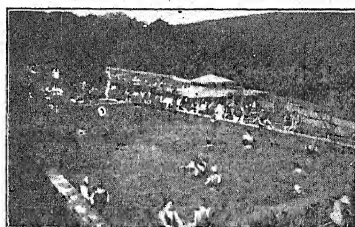
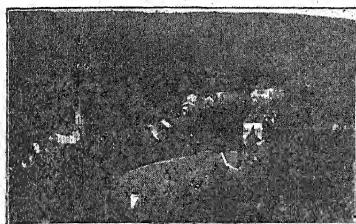
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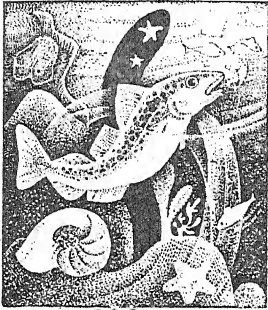
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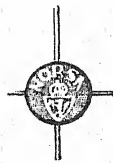
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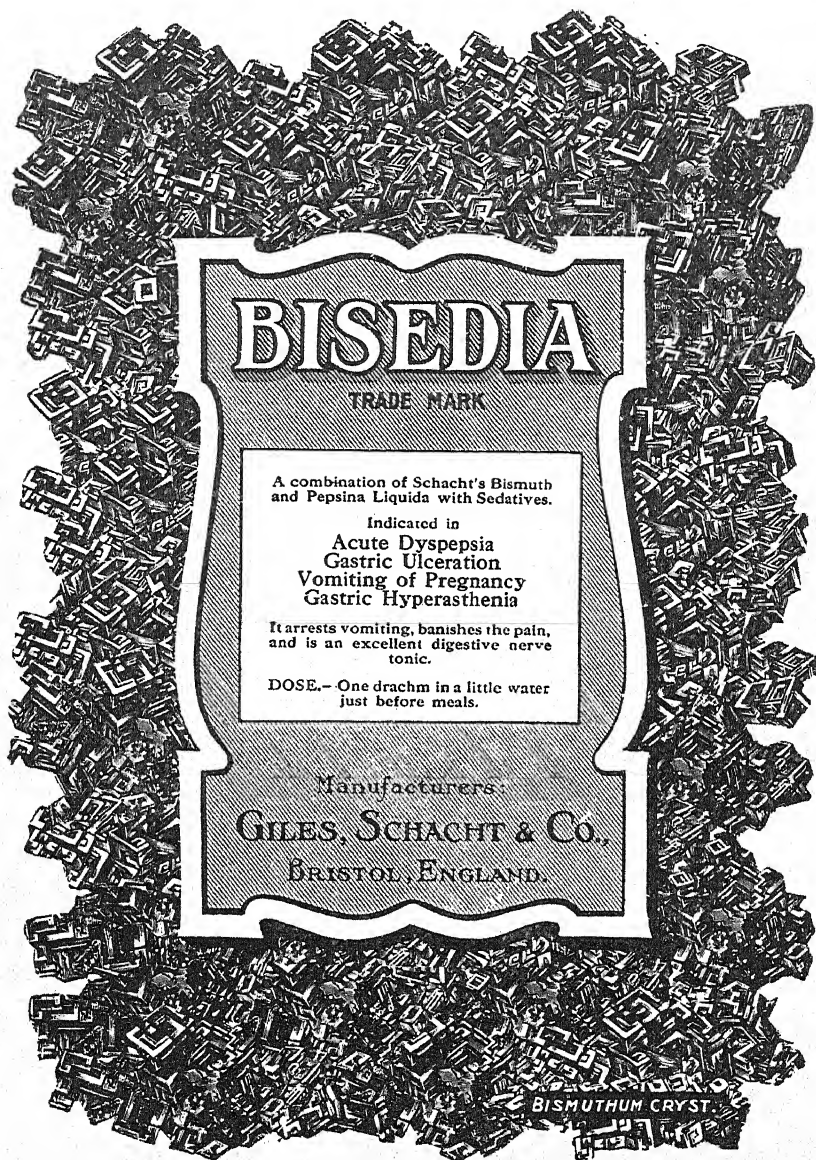
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SUPPLEMENT TO

THE MEDICAL ANNUAL

JUBILEE ISSUE 1932



# THE MEDICAL ANNUAL

## PORTRAITS OF PAST AND PRESENT CONTRIBUTORS

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*The photographs have been arranged chronologically as the various writers first contributed to the Annual. In the alphabetical list of contributors at the end of this supplement will be found a reference to the page in which each portrait appears.*

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### *Foreword*

AN annual publication which has attained its fiftieth year of issue needs no apology, and in presenting this Jubilee volume the Publishers are proud of the fact that to-day the MEDICAL ANNUAL stands higher than ever in the estimation of English-speaking practitioners throughout the world.

Started in 1883 as a modest volume of some 300 pages and printed in Bristol by the present proprietors for a London publisher, it ran an unsuccessful course for the first two years, when its continued existence was threatened by the financial collapse of the publisher concerned. It was then that the opportunity presented itself to the present publishers to enter the field. Mr. Hartland S. Wright, one of the then Partners (now Chairman of Directors), had the foresight to see possibilities in the undertaking, and under the new régime and in collaboration with the late Dr. Percy Wilde the ANNUAL at once began to assume a position of real importance.

The Publishers would like to take the opportunity in this Jubilee issue of expressing once more their deep sense of obligation to the Editors and to the large company of eminent writers who have throughout the fifty years so ably and willingly contributed to the success of the undertaking. That their efforts have been appreciated by the profession generally is shown by the fact that repeated enlargements of the series have been called for, and what began as a small octavo book of 300 pages is to-day a portly volume of over 850 pages, lavishly illustrated in black and colour, and enjoying a very large and world-wide circulation.

As a memento of the occasion of its fiftieth issue, the Publishers are presenting this special supplement containing portraits of all past and present contributors so far as they are available. They wish to thank

most heartily all those writers or their relatives or friends who have so kindly acceded to their request for photographs. It is believed this gallery of portraits, representing as it does so many of the leading medical writers of the period covered, will form a record of outstanding historic interest to the profession. The portraits are not quite complete, as it has been impossible to secure a photograph in every case. We are, however, including a complete list of all past and present contributors to form a permanent record.

The Publishers have been pressed to add a portrait of their Chairman, Mr. Hartland S. Wright, who has recently been obliged to relinquish active work at the advanced age of 83. Mr. Wright has been intimately associated with the production of the ANNUAL from its inception right down to the preliminary work of the present volume. Such a long connection is probably unique in medical publishing, and we believe our contributors and readers will be glad to have the portrait of one whom very many of them know, either personally or by correspondence.

We are indebted to several photographers for the use of copyright portraits : to Messrs. Elliott & Fry for those of Professor A. H. Carter, Mr. F. Richardson Cross, Sir Frederick Eve, Sir James Cantlie, Sir Alfred B. Garrod, Sir Ronald Ross, Mr. Hunter Tod, Mr. Stanford Read, Sir Morell Mackenzie, Dr. Maurice Nicoll, Mr. Stephen Paget, Sir William Smyly, and Dr. Kate Haslam ; to Messrs. Bassano for that of Surgeon Rear-Admiral A. Gascoigne Wildey, C.B. ; and to Messrs. Lafayette for those of Sir William Milligan, Sir William Thorburn, Professor Robert Saundby, and Mr. Hastings Tweedy. Should any acknowledgment have been inadvertently omitted we beg to tender our apologies for the oversight.



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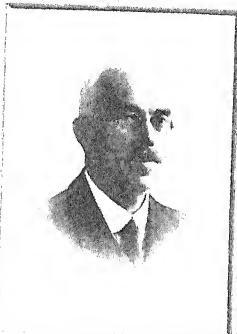
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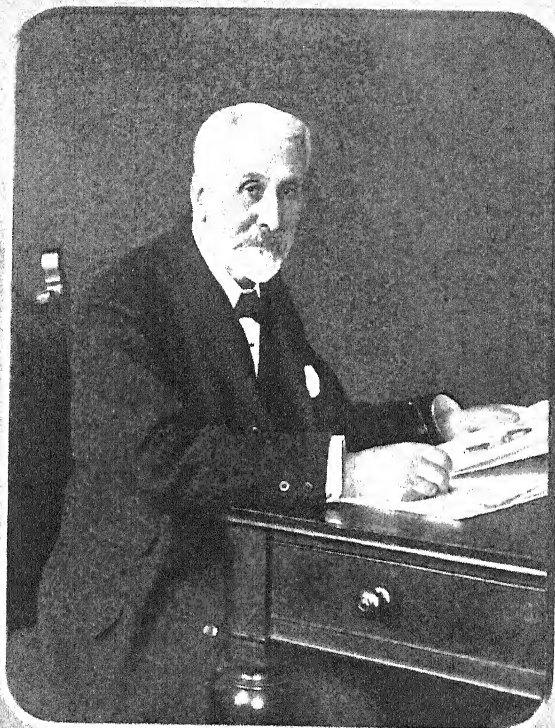
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# THE MEDICAL ANNUAL, 1932

## *A Review of the Year's Work in the Treatment of Disease.*

### INTRODUCTION

BY THE EDITORS.

WE are proud to think that in this volume the MEDICAL ANNUAL celebrates its Jubilee. This is not because we are under any illusion as to our own part in its continued success. Other men have laboured and we have entered into their labours. But we count ourselves fortunate, because we believe that this weapon which has been put into our hands has already done great things in the fight against disease, and we hope that the future may prove us to have been not unworthy of the opportunity thus entrusted to us. Also we are glad because it enables us to pay our tribute to the two men who founded the MEDICAL ANNUAL and watched over its infancy. The first Editor, Dr. Percy Wilde, was a man of great vigour of mind, with a distinct bias towards heterodoxy. This saved the book from banality and gave it a spirit of enterprise that it would perhaps have lacked if it had emanated from a less enterprising brain. But this was not the only or indeed the chief thing that Dr. Wilde gave to the book. He brought to it a devotion which was almost fanatical in its fervour, and there can be little doubt that both to him and to Mr. Hartland Wright, who was closely associated with him in the earlier decades of the ANNUAL, its production was an opportunity of service to the medical profession, and through them to humanity as a whole, which they welcomed with avidity. Of Mr. Hartland Wright it is more difficult to speak, as he is still happily with us, though in retirement; but we feel bound to bear witness to his unfailing charm and courtesy, as well as to the flair for the things that matter which has enabled his firm to publish so many striking and valuable contributions to the progress of medicine. We know that we speak not for ourselves alone, but also for our contributors, when we say that it has been a great privilege to us all to work with him. The publication in this Jubilee volume of portraits of past and present

contributors was a project initiated by him, and may be regarded as his way of acknowledging a sense of indebtedness to every one who had helped to write the book. And we must add a word of appreciation—only a word, as they will not allow us more—of the courtesy and kindness that we have always experienced from all the Directors and other members of the firm of John Wright & Sons. Such relations augur well for the future of our book.

Apart from these portraits, and the very interesting historical note by the publishers, the Jubilee volume does not differ from its predecessors except that it is rather larger than usual. This is mainly due to illustrations, which are more numerous than ever. We print special articles on certain subjects of general interest, and among these would particularly ask attention to those on veterinary surgery and allied subjects. We invited these contributions because we believe that both human and veterinary medicine will gain much from a wider knowledge of both spheres of work. Those in the present volume include paragraphs on distemper and other subjects which are of direct practical interest to medical men.

Another special article is that on continued fever and the differential diagnosis of its causes, one of the everyday problems of practice. There is also (from Holland) a general review of the present position with regard to the treatment of the rheumatic diseases, which gives an idea of tendencies, especially in physiotherapy.

Apart from these special articles there are as usual many points of practical interest. In more than one connection the inhalation of carbon dioxide is proving valuable; for example, in carbon monoxide poisoning better results are achieved if, instead of giving the patient pure oxygen to inhale, 5 per cent of  $\text{CO}_2$  is added. Also it seems that in this emergency oxygen may be injected under the skin with good results. This is particularly useful because it can be carried out while other measures are being applied. In asthma, also, a nasal douche of water saturated with carbon dioxide is recommended.

The various blood diseases are reviewed at length, and we see new etiological principles emerging, for example in the paragraphs on agranulocytosis and secondary anaemia. It seems likely that in pernicious anaemia the obstacle to treatment by liver extract which persistent vomiting may present will be circumvented by intramuscular or intravenous injection of the extract. The value of ferrous salts in large doses in the treatment of the microcytic anaemias of later life seems to be a well-established fact.

Among a number of interesting observations in the paragraph on pharmacology the value of ammonium nitrate as a diuretic is noted. Like ammonium chloride, its administration enhances the action of the newer mercurial diuretics such as salyrgan.

A comparison of the various hypnotics in use showed that chloral hydrate and veronal are the cheapest and best of the non-alkaloidal hypnotics. The effective dose is in both cases lower than is usually supposed,  $2\frac{1}{2}$  gr. being recommended.

One of the contrasts that is most striking between this volume of the ANNUAL and the earliest ones issued is that whereas they were largely occupied with recommending various drugs, it is difficult now to find much that deals with pharmacology. Its place is being taken by studies of physical treatment, of the use of organic extracts, specific sera, and so on. In the field of tropical medicine there is still room for pharmacological enterprise. Nothing has been more remarkable in this direction than the success of antimonial compounds in the cure of kala-azar, and here a new compound, neostibosan, is found to be of value even in children, who show a high death-rate from the disease. Another successful form of chemotherapy is the use of gold compounds (which have proved disappointing in tubercle of the lung) in the treatment of lupus erythematosus.

The claims made on behalf of adrenal cortex in the treatment of Addison's disease appear to be receiving a cautious confirmation. It is, after all, a rare disease, and one cannot therefore expect to amass such information quickly.

We are still not clear as to all the facts of hyperthyroidism, but it becomes increasingly certain that in selected cases, at the optimum moment and usually after preparatory iodine administration, subtotal thyroidectomy is not only safe but actually the best plan of treatment. Possibly radium applications to the thyroid gland may prove valuable in the future. The part played by thyrotoxicosis in the causation of heart disease is increasingly admitted, and it is this that has stimulated a more forward policy in its treatment.

While speaking of heart disease we call attention to lacarnol, a muscle extract that is being used in the treatment of angina pectoris. It has also been found to be of some service in cases of intermittent claudication. Insulin, with sugar, seems to do good in some forms of myocardial disease. We have no means as yet of giving it except by injection—a drawback which is a serious bar to its usefulness in some cases. The article on diabetes reminds us that diet still has to be adjusted even

when insulin is given, so as to keep this down to its minimum dose ; and that a plan of this kind can only be successful if the patient co-operates intelligently and willingly. The vexed question of how to classify renal lesions is discussed, and the sensible view taken that we should not worry too much about categories, but attempt rather to find out what particular kind of damage has been inflicted on the renal tissues in each individual case.

In cerebrospinal meningitis there is reason to think that better results are obtained by giving the specific serum by cisternal rather than by spinal injection. It must also be injected into either muscles or veins. In bacillary dysentery the specific serum has done good when injected by the rectum. The serum treatment of scarlet fever, it is thought, should be reserved for severe cases, as it causes serum sickness in 25 per cent of the cases to whom it is given. In cases of streptococcal septicæmia in childhood, the scarlet fever antitoxin may save life. There is also an interesting discussion of the relative merits of serum and vaccine in the treatment of lobar pneumonia. The great cost of the serum is a practical difficulty. Our reviewer claims that vaccines given early reduce the mortality substantially. On the other hand, we learn that the hopes raised of a vaccinal cure of disseminated sclerosis have been frustrated.

In the paragraphs dealing with disease in childhood we note that allergy in childhood has been relieved by giving hydrochloric acid with pepsin. There is an interesting abstract of Calmette's researches in the preventive inoculation of babies against tuberculosis ; and another of recent work on the contagious factor in juvenile rheumatism.

Before turning to the surgical subjects we invite attention to paragraphs dealing with the psychoneuroses (the growth of which into a serious share of daily practice was recently recognized to the extent of devoting a question to the subject in a Conjoint medicine paper). The value of thyroid extract in some cases of anorexia nervosa is noted. There is a valuable summary of the Mental Treatment Act of 1930.

Our reviewer in general surgery shows us that the modern tendency, largely derived from War experience, is to scrap the majority of amputation methods that used to be taught in operative surgery classes, and to restrict ourselves to a very few good procedures (such as amputation through the middle of the tibia, just above the femoral condyles, and through the hip-joint) that lend themselves to comfortable walking with an artificial leg. Even the Syme amputation stump is apt to become painful after seven or eight years. There is a full, illustrated account,

based on Kanavel's work, of the modern treatment of infections of the fingers and hand ; this is of great practical value. It is mentioned that the pain experienced by some patients when the elastoplast bandage is applied to a varicose ulcer may be relieved by covering the surface with powdered aspirin.

Attention is again called to the danger of giving an aperient to patients with early appendicitis. Out of 131 cases of fatal peritonitis, all but seven had been given an aperient. In some American towns posters have been issued to warn against this practice, and pharmacists have been asked not to sell purgatives without mentioning that they are dangerous if pain is present. We include a summary of the lessons to be learned from a statistical study of the results of medical and surgical treatment in gastric and duodenal ulcer. A method of avoiding vomiting in cases of intestinal ileus which is gaining favour is to leave a small tube in the stomach, passed through the nose and œsophagus, for several days after operation, to act as a drain. The best operation for pancreatic cyst appears to be to approach it through the stomach, and to make a permanent opening from the cyst into the stomach through its posterior wall. This avoids a persistent external fistula.

The surgery of pulmonary tuberculosis is becoming established on a firm basis, and in the opinion of many competent modern observers the best methods, in order of merit, are : (1) Phrenic evulsion ; (2) Pneumothorax ; and (3) Thoracoplasty.

A method of treatment for sciatica that is well spoken of is the injection of the first sacral nerve through the posterior sacral foramen with novocain-alcohol. A full review will be found of the present position with regard to surgery of the sympathetic nervous system. Raynaud's disease can be relieved by excision of the stellate ganglion, or section of the thoracic sympathetic cord, approached from behind. Alcohol injections of the upper thoracic ganglia will often relieve the pain of angina pectoris. In cases of head injury, the symptoms are not always due to increased pressure ; in some cases there is hypotension and the injection of distilled water will give relief.

A very good treatment for painful fissure of the anus is cocaine hydrochloride in castor oil. It is pointed out that a barium enema is by no means an infallible means of diagnosis for cancer of the colon ; in 22 per cent of the cases a cancer was missed. Cancer of the rectum is not as hopeless as is often supposed ; our reviewer publishes a series in which half the cases were alive and well five years after operation.

The treatment of fractures with displacement is greatly assisted by the injection of novocain; this is a very useful device for the practitioner working single-handed. The injection is made into the hematoma about the broken ends. This induces analgesia and muscular relaxation. Certain cases of polyarthritis with raised blood-calcium are greatly benefited by removing the parathyroids on one side. A new method of treatment for the foul wounds of osteomyelitis and other conditions is to fill them with live maggots, to eat out the putrefying matter! This treatment may be effectual, but it seems unlikely to become popular.

In the section dealing with surgical ailments in children, details are given of a plan of treatment for empyema which has reduced the mortality to under 3 per cent. The main points are a not-too-early operation, continuous suction, and irrigation. The thoracotomy is intercostal, under novocain, and a closed method of drainage is used. The new treatment of Hirschsprung's disease (megacolon) by removal of the sympathetic nerve-supply, favourably mentioned last year in the *MEDICAL ANNUAL*, continues to give good results. The diagnosis of tuberculous arthritis is often difficult and precarious, and some methods little used in Britain are discussed in our review of a German publication.

Under diseases of the genito-urinary system, a report is included to the effect that treatment by electrical coagulation, whether per urethram or by suprapubic cystotomy, is much more likely to lead to eradication of papilloma of the bladder than excision. Radon for cancer of the bladder has been disappointing; but in cancer of the prostate many good results are claimed. Cases of enlarged prostate without obstruction, and when there is some good reason against operation, can sometimes be benefited by radiotherapy. Excretion urography, as a substitute for pyelography, mentioned last year, has now come well into favour for certain types of suspected kidney trouble, and a big literature has sprung up. Epithelioma of the penis responds well to radium.

Otitis media following scarlet fever may clear up rapidly after giving scarlatinal antitoxin. A paper is summarized dealing with a type of infection of the air-cells of the petrous temporal bone which is very apt to go on to meningitis, and requires a special operative technique. Auditory vertigo not due to sepsis can often be treated successfully by the destruction of the labyrinth with alcohol, injected through the exposed external semicircular canal. The hearing in these cases has usually been lost already. A good method of treating frontal sinusitis is described, in which a tube is worn for some months projecting from the forehead and passed down the duct into the nose. The technique for destruction of the tonsils by diathermy is described.



Our reviewer in ophthalmology contributes a special article on foreign bodies in the eye, and describes the modern appliances for arriving at an accurate localization. More details are given of the recently introduced and hopeful method of treating detachment of the retina by ignipuncture, which was mentioned in last year's MEDICAL ANNUAL. In the treatment of squint, opinion is coming to favour the prescription of glasses, even for young children; it may be necessary to cover the good eye so as to develop the vision in the other. Various optical instruments are now available to educate eyes to work together.

Various means of producing pyrexia, including malarial infection, gonoyatren, arthigon, and pyrifer, appear to be useful in the treatment of chronic gonorrhœa.

The present-day tendency is to encourage girls to depart as little as possible from their normal routine during menstruation; moderate exercise, and hot baths, are helpful in preventing dysmenorrhœa. The diagnosis and treatment of endometrioma is discussed; as a rule, bilateral oöphorectomy is required. A condition which has recently attracted a good deal of attention is a vaginitis due to *Trichomonas*, which is apt to be mistaken for gonorrhœa. Cases of severe or fatal shock after labour are described and discussed. The opinion is expressed that scopolamine with nitrous oxide is the best available anæsthetic in midwifery. Disturbing evidence is produced that lysol, so largely relied on as an antiseptic, is almost useless; brilliant green is far better. The earliest stages of pregnancy can now be diagnosed with reasonable certainty by biological tests such as the Zondek-Aschheim and its modifications.

We think practitioners will be interested and helped, especially in overseas and rural practice, by the somewhat detailed discussion of the causes and treatment of dental pain (toothache).

The anæsthetists of to-day by no means lack enterprise, and drugs such as nembutal and pernocton, given to make the patient sleepy before the general anæsthetic is administered, are having an extensive trial. This method of preliminary dosing, called 'basal narcosis', has probably come to stay, though it is not clear as yet which is the best drug for the purpose.

Our review of X-ray diagnosis and treatment mentions a new method of visualizing the liver and spleen by giving the patient thorium dioxide and then taking a skiagram. The thorium is absorbed by the cells of the reticulo-endothelial system. There is a very favourable report on the treatment of cancer of the breast by X rays, with or without

operative removal. The oral method appears to be displacing the intravenous for the administration of iodo-compounds for cholecystography.

A method of avoiding secondary  $\beta$  radiations from radium containers is described; a screen of nickel, stainless steel, or copper is used. The combination of X rays and radium gives gratifying results in cases of sarcoma of bone. Very hopeful results are being obtained in cases of advanced and inoperable cancer by means of lead selenide injections assisted by a course of medical treatment. [We can personally vouch for the remarkable success of this method in a considerable number of cases.—Ed.] There is some evidence that pituitrin and ovarian extract may check the growth of a cancer.

Once again, therefore, it is our pleasure to bring to the notice of the medical profession abundant proof that old methods are being discarded and better ones introduced, and that we owe it to our patients to attempt to keep up with the new knowledge.

## DICTIONARY OF PRACTICAL MEDICINE

BY MANY CONTRIBUTORS.

### ABDOMINAL SURGERY, MISCELLANEOUS.

*A. Rendle Short, M.D., F.R.C.S.*

**Direct Anæsthesia of the Peritoneum.**—F. Mandl,<sup>1</sup> of Vienna, and M. Baruch,<sup>2</sup> first of Breslau and now of New York, both advocate direct anæsthesia of the peritoneum by pouring in novocain or percaine solution. Mandl reports 85 cases operated on, in only 9 of which was the anæsthesia inadequate. This included 49 resections of the stomach, with only 6 failures. One may safely use up to 200 c.c. of 1-2000 percaine. Novocain infiltration is used to open the abdomen. At the end of the operation the abdomen is washed out with normal saline.

**Transverse Incisions and Post-operative Pulmonary Complications.**—It is well known that pulmonary collapse, pneumonia, and bronchitis are far more often met with after an operation on the abdomen, and especially the upper abdomen, than after surgery of other regions. D. F. Jones and W. L. McClure,<sup>3</sup> of Boston, found only 4 per cent of serious lung complications in 125 cases in which the upper abdomen was opened by a transverse incision; all these were due to pulmonary embolism, and 2 died. In Elwyn's series, there were lung complications in 6.29 per cent of all abdominal operations, and in 13.8 per cent following gastric surgery.

**Abdominal Injuries.**—The advance that surgery has made of late years, principally in the direction of earlier diagnosis and treatment, is well shown in a paper by E. Just,<sup>4</sup> of Innsbruck. Between 1885 and 1890 the mortality in abdominal injuries was 60 to 70 per cent; during the last five years, of 79 subcutaneous abdominal injuries treated, there was a total mortality of 13.9 per cent; and amongst 35 operated on the mortality was 22.8 per cent. Of 12 cases of rupture of the bowel, only one died. According to C. Clavel,<sup>5</sup> of Lyons, an early sign of rupture of an intra-abdominal viscus is 'peritoneal trembling'—that is, slight undulations of the abdominal wall set up by splashing or percussion, and a sensation of floating of the uterus on bimanual examination. Of course, if the abdomen is rigid, the former sign cannot be obtained.

REFERENCES.—<sup>1</sup>*Zentralbl. f. Chir.* 1930, Nov., 2966; <sup>2</sup>*Ibid.* 1931, May, 1173; <sup>3</sup>*Surg. Gynecol. and Obst.* 1930, Aug., 208; <sup>4</sup>*Arch. f. klin. Chir.* 1930, July, 327; <sup>5</sup>*Presse méd.* 1931, April, 509.

**ABSCESS OF LUNG.** (See ENDOSCOPY; LUNG, ABSCESS OF.)

**ABSCESS, PERITONSILLAR.** (See TONSILS, DISEASES OF.)

**ABSCESS, SUBPHRENIC.** (See SUBPHRENIC ABSCESS.)

**ACHALASIA OF THE CARDIA.** (See CARDIOSPASM.)

**ACHOLURIC JAUNDICE.** (See JAUNDICE, ACHOLURIC.)

**ACIDOSIS IN CHILDREN.***Reginald Miller, M.D., F.R.C.P.*

L. Findlay<sup>1</sup> commendably devotes a lecture to the topic of *acidosis from a clinician's point of view*, in the hope of combating the "much loose thinking and talking about the matter" in which "there is little evidence of a definite nature to support many of the opinions expressed." The need for some such restraint is so clear at the present time that even at the risk of dealing with a certain amount of elementary information it is well to summarize this lecture.

By acidosis, of course, is not meant a true acid state of the blood. The circulation of a free acid (one not combined with an equivalent amount of base) is impossible with the exception of carbonic acid, which is the only free acid found in the blood, whether normal or pathological. "Of the total carbonic acid in the blood, only one-twentieth is normally present in the free state, the remainder being combined with alkali. The ratio between the free and combined carbonic acid is the ultimate factor in determining the ultimate reaction of the blood. The circulation of free acid (other than carbonic) or a really acid reaction of the blood is incompatible with life. What we understand by acidosis is a tendency to the production of such a state if matters were allowed to go on uncontrolled. The symptoms of the condition, as well as the tests available, are evidence of the means the body adopts to hinder this from coming about."

"Acid is always being produced in the body as a result of katabolic activity, but its neutralization and excretion are provided for through the activity of the transport organ (the blood) and the excretory organs (lungs and kidneys). So long as this production of acid remains within normal limits, and the organs engaged in its removal are healthy, there is no evidence of any disturbance. When, however, the production of acid is excessive or pathological in amount, or abnormal or pathological in kind, the efforts of the body must be increased. Further, if the organs employed in the removal of these acids are diseased, not only will the difficulty experienced in their elimination appear earlier, but it will be proportionately greater, as in the case of a diseased heart. It is again a question of balancing the loss with the production, for the body will avoid at all costs the production of a too acid tissue plasma. Signs and symptoms are commensurate with the difficulty encountered in keeping the acid tide under way, and the task may be more than the body can perform. It is probably for this reason that there is the greatest difference between the effects of acidosis arising during the course of a disease and that experimentally or even therapeutically induced. In both, the chemical tests may reveal in equal degree the methods adopted by the body in coping with the rise in the acid tide, but symptoms are noticeably absent when acidosis is experimentally induced and the organs are apparently healthy."

The rôle of the blood is not only of importance in maintaining an equilibrium, but provides by special tests an index to the condition existing. Only a certain definite amount of the acid elements can be carried by the blood, and if some abnormal acid or an excess of a normal acid is present, it can only be at the expense of (and so replacing) so much of one of the other acids, usually  $\text{CO}_2$ : hence a low  $\text{CO}_2$  blood content may be an indication of a tendency to a more acid reaction of the blood and tissue juices.

On the other hand, a low  $\text{CO}_2$  content of the blood may not be due to a tendency to the production of a more acid state of the blood at all, but to a more rapid loss of  $\text{CO}_2$  than normal. This may occur in forced respiration (voluntary or in mountain sickness), or in the hyperpnœa following on encephalitis lethargica. Here, then, the primary change is a loss of normal acid, and the tendency will be towards the production of a more alkaline blood,

the so-called 'alkalosis'. This will tend to be rectified by an increase in some of the other acid elements in the body, the chlorine or the organic acids. This may be shown by the presence of acetonuria, an indication of the increased formation of the organic acids of the oxy-butyric series. Hence acetonuria may exist in acidosis or in alkalosis: in the former it is a primary change producing a rise in the total acids, and in the latter it is from an effort to make up for a deficiency of acid.

The practical upshot of these considerations is that our tests are not so much studying the true reactions of the blood as informing ourselves of the methods of the body in rectifying a loss or increase in the acid elements: and therefore in reading results we must have a knowledge of the factors leading up to the changes observed—that is, a clinical history is essential.

The body is protected from the harmful effects of these variations not only by this buffer action of the blood but also by the excretory functions of the lungs, kidneys, and probably intestines. The lungs get rid of excessive amounts of  $\text{CO}_2$  (hence the hyperpnœa) and the volatile acids of the oxy-butyric series (hence acetone in the breath). The kidneys aid by increased acid excretion, increased ammonia formation, increased excretion of fixed base (Ca from the bones, and Na and K from the tissues), and by diminishing the salts in the body there is an escape of fluid from the kidneys. In all these functions the health of the lungs and kidneys is important; where they are diseased their rectifying capacities are decreased.

This brings us to the last problem: Why does an artificially produced acidosis demonstrate none of the clinical symptoms of that condition? It is easy to produce experimentally an acidosis with a fall in the  $\text{CO}_2$  content quite equal to that observed in disease. This can be done in two ways: either by adding to the body one of its acid elements (Cl) by the administration of  $\text{CaCl}_2$  or  $\text{NH}_4\text{Cl}$ , or by encouraging the incomplete combustion of fat by the use of a diet rich in fat and poor in carbohydrate. Yet no symptoms arise, and moreover in a day or two, without any alterations in the measures to provoke acidosis, the degree of the blood changes becomes modified. "This brings home to us the remarkable powers of the body in accommodating itself to new conditions, and the completeness of these powers so long as the tissues are healthy. It also demonstrates that the symptoms of acidosis, and the progressive and cumulative nature of the condition as met with clinically, are not so much due to any peculiar pathological process as to the inability of the tissues, in consequence of the effect of disease in general on the cells, to exert their inherent regulating mechanism."

To sum up, acidosis must be looked upon as a disorder of metabolism accompanying many diseased processes. Findlay illustrates a valuable point by comparing acidosis with fever; each is the result of a disturbed balance between production and loss. Hence we have no more right to regard acidosis as a clinical entity than we should have to regard fever as an ultimate diagnosis. It is true that at times we can detect acidosis as the only thing wrong with the patient, just as we are faced sometimes with a pyrexia which cannot be explained, yet we must not be any more satisfied with a diagnosis of acidosis in the one case than of fever in the other. Again, we may be forced to treat acidosis as such as a possible danger to life, just as we may have to treat hyperpyrexia; nevertheless in each case there is some underlying condition which must be recognized explicitly if possible, but which in any case must be implicitly accepted.

REFERENCE.—*Brit. Med. Jour.*, 1931, i, 433.

**ACNE ROSACEA KERATITIS.** (See CORNEA, DISEASES OF.)

**ACNE VULGARIS.**

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

B. Bloch<sup>1</sup> gives an account of a very careful statistical study of the relation of acne vulgaris to the changes observable in puberty. From these investigations he concludes that there exists between the start and course of acne and puberty, in so far as the latter is determined by the appearance of the menses and of the pubic and axillary hair, not only a pronounced chronological, but also an inner causal, connection. Earlier writers, even when they attributed to puberty a certain significance for the occurrence of acne, employed many hypotheses to explain why only a certain proportion of individuals suffer from acne—disturbances in menstruation, anomalies of the *vita sexualis* of all kinds, pathological digestion, even disturbances in other ductless glands, food, etc. These theories, Bloch considers, were constructed entirely without proof. He believes that his investigations make the acceptance of such auxiliary hypotheses superfluous. Acne, and particularly its basis, the comedo, appears at a determined age, and is so widespread that it can almost be regarded as a physiological manifestation of the organism at the time of puberty. He finds that of girls of 17 years of age only 5.3 per cent and of boys of 18 years only 0.6 per cent are entirely free from comedones. He concludes that acne in its first phase is a consequence of the physiological function of the sexual glands, analogous to that which we in general assume for the development of the normal secondary sexual features. The degree of formation is individually different. This may depend on the fact that the production of the sexual hormone is varied in strength in each individual, or (as seems to him more likely) that the follicular apparatus of the skin is individually different in its sensibility to this hormone. As a result the fact emerges that in acne the normal physiological action of a ductless gland—the sexual gland—on the skin leads through transition stages to a final effect which is pathological—a real disease of the skin, namely, acne.

E. Ramel<sup>2</sup> has considered the disease from another standpoint. He noticed the resemblance of the lesions in certain types of nodular acne vulgaris to tuberculous gummata. He therefore examined the pus from certain of these cases, and in 9 out of 17 cases was able, by certain methods, to demonstrate acid- and alcohol-fast bacilli. The cases chosen were carefully examined and no clinical evidence of tuberculosis was found, and all gave negative tuberculin reactions (old tuberculin by Pirquet's method). He further inoculated pus from 10 cases into guinea-pigs, and in 6 a slowly progressive and fatal tuberculosis developed. Further than this, Ramel has demonstrated the presence of acid-fast bacilli in the urine in six acne patients; he has shown that this bacilluria may be transitory; for example, in a case where the acne lesions appeared only at the menstrual periods, the urine was free from acid-fast bacilli from ten to twelve days following the period. He concludes that acne vulgaris is a species of colliquative tuberculosis in an attenuated form, of hæmatogenous origin and that the bacteræmia may be transitory.

**TREATMENT.**—A. Sézary<sup>3</sup> recommends the application of 1 per cent **Iodine** in 90 per cent **Alcohol** to the face in cases of acne vulgaris. The application is made each night without previous washing and without ointment applications. The staining is so slight that it has disappeared in the morning. Lesions clear in four to ten days: the application should be continued for another week nightly and then every second or third night for a few more weeks. For skin abscesses in acne vulgaris, he recommends evacuation through a fine needle and the injection into the cavity of 10 per cent **Witte-Peptide Solution**: the treatment should be repeated every second day, and two to five injections should produce a cure without scar formation.

REFERENCES.—<sup>1</sup>*Brit. Jour. Dermatol. and Syph.* 1931, Feb., 76; <sup>2</sup>*Bull. Soc. franç. Dermatol. et Syph.* 1930, Nov., 1193; <sup>3</sup>*Progrès méd.* 1930, ii, 1902.

*PLATE I*

ACRODERMATITIS PERSTANS



Pustular psoriasis type of acrodermatitis





**ACRODERMATITIS CONTINUA VEL PERSTANS.**

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

In the MEDICAL ANNUAL for 1929 (p. 433) reference was made to some important observations by H. W. Barber and J. W. H. Eyre on three cases of a rare pustular eruption mainly on the extremities which was described by Hallopeau in 1890 under the name 'acrodermatitis continua'. Barber and Eyre considered that their three cases were caused by infection with a special strain of *Staphylococcus pyogenes aureus*. A further contribution to the etiology of this condition has been made by H. W. Barber<sup>1</sup> and also by J. T. Ingram.<sup>2</sup> Both these observers consider that two distinct types of pustular dermatitis, mainly affecting the hands and feet, are found.

In the first type, which corresponds to the cases described by Barber and Eyre, the eruption in the majority of cases is limited to the extremities, but rarely may become generalized. The histological picture is the same both on the extremities and elsewhere. Usually there is a history of an initial injury followed by the successive infection of the nails of both hands and feet, and the appearance of groups of discrete pustules on healthy skin, which spread centrifugally, stripping off the horny layer as they spread. The mucous membranes are affected in a number of cases. Bacteriological cultures give an abundant and predominant growth of *Sta. aureus*, exhibiting the faculty of growing on media inimical to ordinary strains of staphylococci.

In the second type the eruption comes out without history of an injury, has a much greater tendency to be bilateral and symmetrical, the sites of election being the thenar eminences and the insteps. The mucous membranes are not affected. The lesions differ from the preceding type in that the pustules form not in apparently normal skin, but in reddened, often scaly, patches; they are small and intra-epidermic, but may become confluent. The patches may often resemble closely those of eczematoid ringworm (*Plate I*), though vesicles are never present in this form of acrodermatitis. The nails are very rarely affected, but when they are, the lesions are non-suppurative and comparable with those of ordinary psoriasis. Microscopical and cultural examination for fungi and pathogenic bacteria are negative. Both Barber and Ingram show that this second type of case can be associated with typical psoriasis and that the histology of the lesions has a close resemblance to those of psoriasis.

Both these authors therefore conclude that under the name of 'acrodermatitis continua or perstans', two distinct conditions exist which have formerly been confused: first a definite clinical entity due to the infection of the skin by a special type of *Staph. aureus*, and the second a pustular form of psoriasis.

REFERENCES.—<sup>1</sup>*Brit. Jour. Dermatol. and Syph.* 1930, Nov., 500; <sup>2</sup>*Ibid.* 489.

**ACTINOMYCOSIS.**

Sir W. I. de C. Wheeler, F.R.C.S.I.

H. P. Jacobson<sup>1</sup> states that the duration of the disease varies from a week (cerebrospinal type) to seven, eight, or ten years in the cutaneous type. Obviously the duration depends upon the particular organ or system involved. The pulmonary type usually terminates fatally within a year.

In the case of the tongue or the skin, early **Surgical Radical Treatment** combined with large doses of **Iodides** and occasionally **X Rays** will irradiate the disease. The iodides should be given in large doses, commencing with 10 or 15 drops three times daily and gradually increasing the dose to the point of tolerance, which frequently is as high as 300 to 400 drops of the saturated solution of potassium iodide. Potassium iodide is tolerated best when taken in milk. Jacobson uses in addition **Colloidal Copper** injections at four- to

seven-day intervals. When the parasite is of the virulent type, therapeutic measures are powerless to effect a cure.

The same writer<sup>2</sup> states that nearly 60 per cent of cases of actinomycosis occur in the head and neck. About 18 per cent are abdominal, involving the wall or cavity, the intestines, appendix, and liver. [The reviewer has seen the disease in the duodenum and jejunum.] There is on record one instance of the gall-bladder being involved. The thoracic type was found in almost 14 per cent of the cases, the chest wall and lungs being the chief locations.

In the case of the tongue, the condition begins with a small deep-seated nodule in the body of the tongue which is at first painless. The nodule in a few days or weeks begins to soften, and discharges a small amount of pus containing the characteristic granules in which the ray fungus may be found. This process repeats itself. In the absence of proper treatment, the infection extends to the submental area, with nodule and tumour formation, softening, ulceration, sinus formation, and induration of the surrounding tissues.

REFERENCES.—<sup>1</sup>*Med. Jour. and Record*, 1930, Oct. 15, 379; <sup>2</sup>*Ibid.* Oct. 1, 342.

**ADDISON'S DISEASE.** (See ENDOCRINOLOGY; SUPRARENAL GLANDS.)

**ADRENAL GLANDS.** (See SUPRARENAL GLANDS.)

**AGRANULOCYTOSIS (Agranulocytic Angina).** (See also PHARYNX, DISEASES OF.) *Stanley Davidson, M.D., F.R.C.P.E.*

NOMENCLATURE.—According to L. P. Hamburger,<sup>1</sup> Schultz, in 1922, was responsible for classifying this disorder as a disease entity, under the name 'agranulocytosis'. Shortly afterwards Friedemann, impressed by the localization of the process in the throat, suggested the title 'angina agranulocytica'. C. W. Baldridge and R. J. Needles<sup>2</sup> believe that this title is unfortunate, both because of the intrinsic ambiguity of the term 'agranulocytosis' and because it implies that we are dealing with a mouth infection which causes neutropenia, instead of a syndrome of utterly unknown etiology. The authors suggest the name 'idiopathic neutropenia', to denote the diminution of output of granular leucocytes in the same way that 'idiopathic thrombocytopenia' and 'idiopathic aplastic anæmia' designate diminished output of platelets and red blood-corpuscles respectively. W. Dameshek and M. Ingall<sup>3</sup> also object to the name 'agranulocytic angina', since the throat lesions may be slight or even absent, and they believe that the term 'malignant neutropenia', as suggested by Schilling, is possibly the best definition of the syndrome. The present writer is inclined to agree with these views. In Schultz's original classification the essential clinical features included an acute onset with high fever, usually in a middle-aged woman, a course marked by ulceration of the mouth and throat, leucopenia characterized by a marked decrease or absence of granular leucocytes, a normal red-cell and platelet count, and a fatal termination. Although it is only nine years since Schultz's original observations were published Dameshek states that about 200 cases have since then been reported in the literature. A critical review of the literature by the reviewer makes it clear that a state of chaos exists to-day, since the term 'agranulocytic angina' has been transferred from its original meaning to a host of conditions characterized by a leucopenia which was secondary to recognized etiological agencies. All cases secondary to poisoning with arsenical and benzol preparations, to irradiation, to obvious bacterial infection, etc., as well as cases of aplastic anæmia and aleukæmic leukæmia, should be discarded. Even when this is done some of the cases reported do not conform in every way to the original classification, since it is now recognized that only the fulminating cases with rapidly fatal

termination show no change in the red-cell and platelet picture. Anæmia and hæmorrhages, as well as leucopenia, are present in all cases which survive for several weeks.

H. N. Harkins,<sup>4</sup> Baldrige and Needles, Dameshek, and others, are of opinion that the primary disorder lies in a depressed function of the granulocytic mechanism of the bone-marrow, and that infection of the throat is secondary. Many of the patients had suffered from chronic ill health or loss of vitality for years, and in some in whom the white-cell count had been previously made, some degree of leucopenia was known to be present before the onset of the syndrome. The patient is believed to have a lowered resistance, and when infection takes place rapid necrosis is produced, and a massive toxæmia results, which overwhelms the already weakened bone-marrow and rapidly causes death.

**BACTERIOLOGY.**—*Spirochaetes*, Gram-positive cocci of all types, and numerous forms of Gram-negative bacilli, have been cultured from the throat lesions and from the blood-stream, but it is believed by the majority of workers that these organisms are not specific causal agents, but are to be regarded as terminal invaders.

**CLINICAL MANIFESTATIONS.**—Hamburger<sup>1</sup> groups his fifteen cases into three main categories: (1) The fulminating type of Schultz, death occurring in a few days; (2) The type in which the illness is more prolonged, with death or recovery in a few weeks; (3) The relapsing type, with cycles of attacks, separated often by months.

H. Mandelbaum<sup>5</sup> describes the clinical features and post-mortem appearances of four cases. Apart from intense ulceration of the throat and toxæmic changes in all organs, nothing specific was found at post-mortem. Harkins reports 8 cases, with 3 recoveries. Dameshek and Ingall give an excellent review of the clinical manifestations of the disease, based on 9 cases, which includes a critical survey of the problem of differential diagnosis.

They state that examination of the sternal bone-marrow removed at biopsy showed little change in the erythroblastic tissue, but a complete absence of myelocytes and polymorphonuclear leucocytes. Myeloblasts were present in fair numbers, and it was suggested, therefore, that the disease was in some way associated with a failure in the maturation of myeloblasts.

The general opinion expressed is that the death-rate lies between 80 and 90 per cent. Under the title of "Leucopenia resembling Agranulocytosis, with Recovery", W. P. Thompson<sup>6</sup> describes seven cases of a transient infectious disease, with agranulocytosis, which ended in prompt complete recovery. The condition described has features which make it more like infectious mononucleosis (glandular fever) than agranulocytic angina.

**DIAGNOSIS.**—The diagnosis in a typical case is fairly easy. The sudden appearance of sore throat in a middle-aged person, usually debilitated, accompanied by chill, high fever, ulceration, and membranous formation in the throat, should suggest a diagnosis of agranulocytosis, particularly when the fever and toxæmic symptoms are out of all proportion to the amount of ulceration and membranous formation in the throat. Acute follicular tonsillitis, streptococcal sore throat, Vincent's angina, and diphtheria, are to be differentiated by appropriate clinical means, and all show as a rule a normal or increased leucocyte count, while in this disease there is a marked leucopenia, with agranulocytosis. The importance, therefore, of making routine blood examinations in all cases of unknown continued fever is to be emphasized. The diagnosis of the case without angina, associated only with fever and with few clinical signs, especially if life has been prolonged for some weeks so that anæmia and hæmorrhages are present in addition to leucopenia, is much more difficult. Typhoid fever,

influenza, rapidly advancing tuberculosis, lymphosarcoma of the Hodgkin's type, aplastic anemia, and the aleukemic varieties of leukemia, must all be considered. The reader is recommended to consult the paper by Dameshek and Ingall for information regarding the differential diagnosis.

**TREATMENT.**—No treatment is of any value in the fulminating cases, and even in the milder varieties Dameshek believes that when remissions occur they are spontaneous and not due to any specific treatment. The different forms of therapy which appear to have some justification are: (1) Repeated transfusion of 250 to 500 c.c. of **Citrated Blood** every other day or at longer intervals. (2) Irradiation of the skeleton with small doses of **X Rays**. This treatment is based on the law that small doses stimulate, while large doses destroy, radio-sensitive cells. C. A. Waters and W. B. Firor<sup>7</sup> have treated four cases successfully, and quote a report of Friedemann, who claims thirteen cures. (3) Injection of **Leucocytic Extract** in an attempt to stimulate the reticulo-endothelial system. (4) Vigorous local treatment of the oropharyngeal lesion. Hamburger recommends spraying the lesion with a saturated solution of **Potassium Chloride** after each feed, followed by swabbing with a solution of **Copper Sulphate**, 10 gr. to the ounce.

REFERENCES.—<sup>1</sup>*Johns Hopkins Hosp. Bull.* 1931, May, 339; <sup>2</sup>*Amer. Jour. Med. Sci.* 1931, April, 533; <sup>3</sup>*Ibid.* 502; <sup>4</sup>*Arch. of Internal Med.* 1931, March, 408; <sup>5</sup>*Med. Jour. and Record*, 1930, Dec. 3, 535; <sup>6</sup>*Amer. Jour. Med. Sci.* 1931, Feb., 240; <sup>7</sup>*Johns Hopkins Hosp. Bull.* 1931, May, 349.

## ALCOHOL AND DRUG ADDICTION. Henry Devine, M.D., F.R.C.P.

**Chronic Alcoholism.**—E. S. Cowles<sup>1</sup> thinks that out of the great number of people who drink, in a relatively few alcohol sets up an irritation of the meninges, and when this meningeal irritation is developed and the edema in the brain increased, they are no longer able to control themselves with respect to drink. In many alcoholic cases a mild manic-depressive trend is present, but Cowles has found on taking the spinal fluid of these patients and finding an increased intracranial pressure and definite irritation, that their manic manifestations have disappeared as the pressure was relieved and the irritation removed. Their violent emotional reactions completely subsided and a normal emotional reaction established itself.

**TREATMENT.**—**Lumbar Puncture** is the treatment adopted by the writer for his cases of alcoholism. He regards the technique as being of vital importance. Not more than 10 to 12 c.c. of the spinal fluid need be drawn at a time, and this fluid must not be allowed to spurt continuously from the needle, but the needle plunger must be inserted from second to second in order to prevent trauma to the brain cells by the circulatory effort to fill the vacuum created by too rapid withdrawal of the spinal fluid. Cowles has noted that in drawing the fluid rapidly and uninterruptedly the patient gets a disagreeable reaction with more or less prolonged discomfort. In those cases which would be subject to shock this rule has been followed by a notable absence of shock. No ill effects have followed from lumbar puncture in these cases. In the average case unattended by delirium tremens it has been the practice of the writer not to do a lumbar puncture for a week after the patient has been freed from alcohol.

The method recommended for freeing the patient from alcohol is as follows: He is put to bed, given four tablespoonfuls of **Elixir of Paraldehyde**, followed by **High Colonic Irrigation**, and two hours later two **Vegetable Cathartic Pills** and a glass of **Pluto Water**. The following day he is given 10 gr. of a **Chloral-Bromide Solution**, this to be followed by four tablespoonfuls of **Castor Oil** and two colonic irrigations, one in the morning and one at night.

From the very beginning of his treatment the patient is induced to drink all the **Lemonade** with **Bicarbonate of Soda** he can possibly take, and for the first six weeks he is given a **Salt-free Diet**. No alcohol whatever is permitted. In twelve hours after beginning the treatment the patient is apparently normal. The trembling is removed by small doses of the chloral-bromide solution, of which only one dose is given in twenty-four hours. The second night the patient is given two tablespoonfuls of elixir of paraldehyde, and thereafter needs nothing to induce sleep so far as his alcoholism is concerned, but if necessary the chloral-bromide may be given to overcome his emotional instability. In no case does the author permit any narcotic drug.

The duration of the treatment is dependent upon the abnormal increase in the spinal fluid. Until these patients are clear in their pathology, as evidenced by spinal fluid pressure and laboratory findings, they are subject to relapse. The laboratory reports of the spinal fluid in one of the writer's cases show the pathological findings characteristic of the chronic alcoholic cases:—

	NOVEMBER 29, 1926.	APRIL 23, 1927.
Pressure	.. 45 mercury millimetres	10 mercury millimetres
Colour	.. Clear	Clear
Cells	.. 5 per cubic millimetre	None distinguishable
Albumin	.. Increased	Negative
Globulin	.. Slight increase	Negative
Colloidal gold	.. 0000000000	0000000000
Wassermann	.. Negative	Negative
Alcohol	.. Positive	Negative

This paper includes a number of case-histories of alcoholic patients treated by Dr. Cowles.

**Bromide Intoxication.**—T. H. Harris and A. Hauser<sup>2</sup> state that on account of the widespread use of bromide in neuropsychiatric disorders, and because of the fact that most 'patent' remedies recommended for their sedative effect contain this drug, bromide intoxication is a very common syndrome, and that there are many cases that fail to be recognized. In three months the writers have observed 7 cases, and F. G. Ebaugh, Director of the Colorado State Hospital, recently stated that of 500 admissions 7 per cent were cases of bromide intoxication. The frequent occurrence of the condition is accounted for by the fact that there is a tendency for bromide to be retained in the body instead of being eliminated rapidly.

**CLINICAL FEATURES.**—The clinical picture of bromide intoxication is essentially that of an acute organic or toxic reaction with the presence of some organic physiologic signs. Stupor, which may develop into coma, is usually present. The patient is confused, disoriented, and shows a complete loss of memory for recent events. In the less severe cases, and even in the severe cases after the stupor has disappeared, hallucinations and delusions are prominent. The hallucinations are usually visual and auditory, and the former are frequently of the coloured type. Fabrication and confabulation are usually present, and in some cases are associated with a typical Korsakoff syndrome. Ideas of persecution often appear, and a manic-like picture occurs in some cases, while in others there is depression. During the stupor stage various neurologic signs are evident. The speech is thick, slurred, and hard to understand, and swallowing is difficult. Diplopia may be complained of, and the pupils may be unequal and react sluggishly to light. The corneal and pharyngeal reflexes are sluggish or absent. All deep reflexes are diminished and the abdominal reflexes are frequently absent. There is tremor of the extremities and ataxia. Respiration is slow and shallow, the pulse rapid and feeble, and the temperature may range from 100° to 103° F. The bromide rash may not

appear. This syndrome may be confused with a number of neurologic conditions and acute toxic states—acute alcoholism, alcoholic Korsakoff syndrome, chronic alcoholism, epidemic encephalitis, dementia paralytica, uræmia, head trauma, intoxication from other drugs, tuberculous meningitis, and other psychoses of toxic origin. The picture of bromide intoxication is sometimes identical with such states, and can be differentiated only by examining the blood, since the history of having taken bromide is not always present.

The blood determinations in the writer's cases were done with the Wuth comparator.<sup>3</sup> This apparatus is inexpensive and the technique is simple. Ten cubic centimetres of blood taken from the patient is allowed to clot; 2 c.c. of serum of this blood specimen, 4 c.c. of distilled water, and 1.2 c.c. of 20 per cent trichloroacetic acid are added. After standing for half an hour, the mixture is filtered. To each cubic centimetre of the filtrate 0.2 c.c. of 0.5 per cent gold chloride solution is added, and this is compared with the standard colour tubes. The colour tubes register amounts from 75 to 300 mgrm. per 100 c.c. of serum.

**TREATMENT.**—After clinical opinion has been confirmed by this fairly rapid method of determination of the blood bromide content, the treatment is relatively simple. It consists of forcing **Fluids** and administering large amounts of **Sodium Chloride**. If the patient is unable to take fluid by the mouth, physiologic solution of sodium chloride may be given by rectal drip and hyperdermolysis. Usually after twenty-four hours of this medication the patient will be aroused enough to take liquids by mouth, and physiologic solution of sodium chloride may be given in amounts of 8 oz. every two hours. After twenty-four hours of this treatment the patient may become restless and difficult to control, and he frequently expresses ideas of persecution and has hallucinations. These symptoms gradually subside as the bromide is eliminated, and recovery occurs in from ten days to three weeks, depending upon the severity of the bromide retention.

The writers state that bromide intoxication occurs in any individual whose bromide intake exceeds or is equal to the chloride intake, and is especially liable to develop when other toxic factors or chronic diseases are present. As soon as 30 per cent of the chloride content of the blood is replaced by the bromide ion, toxic symptoms usually appear.

Since March, 1928, C. P. Wagner and D. E. Bunbury<sup>4</sup> have investigated the bromide content of the blood as part of the routine in the examination of all patients admitted to the Colorado Psychopathic Hospital, and have written a paper on a study of the first thousand cases thus consecutively examined. Of these 7.7 per cent showed bromide in the blood serum in a concentration of 75 mgrm. per 100 c.c. and over. *Table I* shows the sources of bromide.

*Table I.*

SOURCE OF DRUG	NUMBER OF PATIENTS	PERCENTAGE OF PATIENTS WITH BROMIDE SERUM	PERCENTAGE OF TOTAL NUMBER EXAMINED
Prescribed by physician ..	33	42.85	3.3
Undetermined ..	30	38.95	3.0
'Nervine' ..	6	7.79	0.6
Other 'patent' medicine ..	8	10.39	0.8

The writers observe that the intoxications could have been prevented when the drug was prescribed by the physician had the latter been more familiar with the untoward mental symptoms of bromide overdosage, or if he had been

willing to make a blood examination according to Wuth's simple method. Table II shows the incidence of bromide intoxication in the various psychotic conditions.

Table II.

NATURE OF PSYCHOSIS	WITH TOXIC SYMPTOMS				WITHOUT TOXIC SYMPTOMS				TOTAL	PER CENT OF 77 CASES SHOWING BROMIDE
	75-125 mgm. 100 c.c.	Over 125 and less than 200	200 and less than 300	300 and over	75-125 mgm. 100 c.c.	Over 125 and less than 200	200 and less than 300	300 and over		
Psychoneuroses .. ..	0	0	0	0	11	1	0	0	12	15.6
Manic-depressive depressed reaction .. ..	3	0	1	0	6	1	0	0	11	14.3
Pure bromide intoxication .. ..	1	0	2	7	0	0	0	0	10	12.9
Schizophrenia .. ..	2	2	1	0	4	0	0	0	9	11.7
Mixed drug intoxication .. ..	1	1	2	3	0	0	0	0	7	9.1
Cerebral arteriosclerosis .. ..	3	2	2	0	0	0	0	0	7	9.1
Epilepsy .. ..	1	1	0	0	3	0	1	0	6	7.8
Dementia paralytica .. ..	1	2	0	0	1	0	0	0	4	5.2
Senile psychoses .. ..	1	0	1	0	0	0	0	0	2	2.6
Post-traumatic psychoses .. ..	0	1	0	1	0	0	0	0	2	2.6
Manic-depressive manic reaction .. ..	0	0	0	0	0	1	0	0	1	1.3
Cerebrospinal syphilis .. ..	0	0	0	0	0	0	1	0	1	1.3
Brain tumour .. ..	1	0	0	0	0	0	0	0	1	1.3
Post encephalitis .. ..	0	0	0	0	1	0	0	0	1	1.3
Amyotrophic lateral sclerosis .. ..	0	0	0	0	1	0	0	0	1	1.3
Infection with delirium .. ..	1	0	0	0	0	0	0	0	1	1.3
Unclassified .. ..	0	0	0	0	1	0	0	0	1	1.3
Totals .. ..	15	9	9	11	28	3	2	0	77	100.0

It is of interest and somewhat surprising to note in this table that the highest incidence of bromide intoxication occurred in those patients (pure bromide and mixed drug intoxications, 17 cases) who showed no underlying psychotic condition after elimination of bromide. These patients consisted for the most part of that type of individual who is unable to make an adequate social adjustment and who resorts to alcohol and drugs as an escape from the situations in life which he considers intolerable.

This article includes a number of interesting clinical observations and charts showing the rate of bromide elimination in patients under treatment. The writers state that it is not wished to give the impression that they consider bromide harmful or even useless as a therapeutic agent, but they do believe that bromides are used much too indiscriminately and frequently produce harmful rather than beneficial effects.

REFERENCES.—<sup>1</sup>*Med. Jour. and Record*, 1931, May 6, 417, and May 20, 473; <sup>2</sup>*Jour. Amer. Med. Assoc.* 1930, July 12, 94; <sup>3</sup>*Ibid.* 1927, June 25, 2013; <sup>4</sup>*Ibid.* 1930, Dec. 6, 1725.

**ALEUKIA HÆMORRHAGICA.** (See ANÆMIA, IDIOPATHIC APLASTIC.)

**ALLERGY IN CHILDREN.** (See also ASTHMA.)

Reginald Miller, M.D., F.R.C.P.

**Asthma and Hypochlorhydria.**—In last year's MEDICAL ANNUAL (p. 57) an early mention was made of G. W. Bray's interesting announcement<sup>1</sup> that he had found hypochlorhydria to be frequent in asthmatic children, and this

year we are able to review the evidence brought forward by the same author<sup>2</sup> in a special communication devoted to this same subject. He now records the results of fractional test-meal analyses in 200 asthmatic children of various ages and in 50 normal children used as controls. He employed two varieties of test meal, the oatmeal gruel (Rehfuss), and a 7 per cent dilution of neutral ethyl alcohol in distilled water. In the asthmatic series he found that the response of acid gastric secretion was below the average normal in 80 per cent of cases. In healthy children, as the result of his own work and that of other investigators, he takes 20 per cent as a generous estimate for the number of hypochlorhydries. In a small group of allergic children other than asthmatics he found a similar though not quite so marked a tendency towards hypochlorhydria. As regards the influence of age he found a deficiency of acid secretion was more frequent and more pronounced before than after the age of seven years. Towards puberty the acid curve tended to rise, though more so in boys than in girls. Apart from this particular, sex did not appear to exert any pronounced influence on the frequency of hypochlorhydria.

Bray argues that the hypochlorhydria noted is causally related to the disorder of asthma, and suggests that the defect in the gastric secretion prevents the proper digestion of protein, and thus allows the absorption of large amounts of undigested protein with their accompanying 'reaction-producing substances'. Were the hypochlorhydria merely the result of the allergic state, it would be expected to persist or increase as age advances without relief of symptoms, whereas the opposite occurs; and the improvement of the gastric secretion at puberty roughly corresponds with the improvement in the asthmatic tendency. How far hypochlorhydria is concerned with food asthmas only is a difficult question, but Bray notes that the food factor tends to decrease as age advances and inhalant sensitization to become the common type, and that this alteration corresponds to the alteration in the frequency of hypochlorhydria at the different ages as already described.

**TREATMENT.**—Bray reports excellent results from the administration of **Hydrochloric Acid with Pepsin**. Commencing with a few minims of dilute hydrochloric acid (B.P.), he advises that the dose should be gradually increased. The optimum dose is often as much as 20 to 30 min. thrice daily, and in the case of achlorhydries 60 to 90 min. If care is taken to remove the offending allergens, especially inhalants, there is an immediate improvement in appetite and a gain in weight with the acid therapy. After three months or more of treatment on these lines, cessation of the asthmatic attacks often occurs.

**Allergic Enuresis.**—G. W. Bray<sup>3</sup> makes the interesting suggestion that certain cases of persistent enuresis in children should be regarded as examples of allergy. Such cases may be found in association with symptoms of known allergic origin, but enuresis may be the sole manifestation of the allergic state in a child. If the nerve-supply of the bladder is compared with that of the lungs, it is seen that the same disorder of the parasympathetic system which gives rise to asthma may, depending on the location or intensity of the stimulus, give rise to evacuation of urine. He has been able to watch the effect on enuresis produced by the treatment of asthma and other allergic conditions, and has had successful results in some cases where enuresis was the sole sign of allergy by eliminating substances giving positive skin reactions. He states that it is not uncommon to find that treatment of asthma by ephedrine leads to inability to micturate, an interesting point illustrating the possibility of an association between asthma and enuresis.

**REFERENCES.**—<sup>1</sup>*Arch. of Dis. Childh.* 1930, v, 237; <sup>2</sup>*Quart. Jour. Med.* 1931, xxxiv, 181; <sup>3</sup>*Arch. of Dis. Childh.* 1931, vi, 251.



**ALOPECIA AREATA.**

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

A. C. Roxburgh<sup>1</sup> describes some experiments undertaken to determine the condition of the cutaneous vessels in patches of alopecia areata. Using the method devised by Sir T. Lewis for determining skin temperature, he found that there was no substantial difference in the surface temperature between the area of alopecia and the adjoining normal skin. This appeared to show that alopecia areata was not due to restriction of the blood-supply to the affected areas as had been suggested by some authors. Evidence was brought forward that the erythema after a dose of **Ultra-violet Light** only increases the surface temperature by about 0.5° C., so small a rise being inconsistent with any appreciable dilatation of the deeper arterioles. It is suggested that the beneficial results of ultra-violet light in this disease do not depend upon its vasodilator effect, but upon its stimulating effect upon cell division and keratinization in the epidermis of which the cells of the hair-matrix are developmentally a part.

REFERENCE.—<sup>1</sup>*Brit. Jour. Dermatol. and Syph.* 1931, Jan., 20.

**AMOEBIASIS.** (See also PYREXIA, CONTINUED.)

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

The incidence of *E. histolytica* infections in Leningrad is dealt with in two papers by A. A. Philitschenko,<sup>1,2</sup> who examined 604 persons once each for intestinal parasites and found them present in 65.5 per cent of food-employees, including *E. histolytica* in 22.75 per cent, which were also present in 25.3 per cent of 162 non-dysenteric patients treated at a dispensary for various gastro-intestinal disorders; but only 9.5 per cent of 42 children were so infected. In another series of 225 barrack-hospital patients 14.2 per cent showed *E. histolytica* infection, and the author states that about 15 to 20 per cent of autumnal acute diarrhoea cases were true amoebic dysentery and 9.8 per cent were bacillary dysentery.

An analysis of 426 post-mortems on human amoebiasis in Bombay is contributed by P. V. Gharpure and J. L. Saldanha.<sup>3</sup> In 169 hepatic abscesses were present, and in 257 only intestinal lesions, usually chronic in nature, but with a maximum distribution in January to November. Over 80 per cent of the liver-abscess subjects were between the ages of 21 and 50 years, and 94 per cent were male; only four of the fatal cases had been treated by repeated aspiration, all prior to 1900. In 62.4 per cent only a single abscess was present, multiple abscesses exceeding a dozen were present in 11.5 per cent, and in over 60 per cent the accompanying amoebic intestinal lesions were acute. The histories of the liver-abscess cases showed symptoms of over fifteen days' duration in 90 per cent, and of over one month in 72.5 per cent.

A. G. Biggam<sup>4</sup> reports two very acute fatal amoebic-dysentery cases in which the lowest six inches of the ileum was involved in the ulceration. In one no amoebae were found in the stools, but amoebiasis was diagnosed by sigmoidoscopy; and the writer draws attention to the danger of these cases being overlooked, and specific treatment being omitted until too late, owing to the recent knowledge that bacillary dysentery is more common than amoebic in many countries. The same writer, with M. A. Arafa,<sup>5</sup> deals with the sigmoidoscopic diagnosis of dysenteries on the usual lines, and they include excellent coloured plates of the conditions met with in amoebic and bacillary dysentery respectively.

**TREATMENT.**—The resistance of *E. histolytica* to **Emetine Hydrochloride** has been tested by A. Halawani,<sup>6</sup> who found that it could be raised by passing the organism systematically for a long period through graduated concentrations of the drug, and that the amoebae retained their reproductive powers. The

emetine treatment is discussed by A. C. Reed<sup>7</sup> with special reference to the toxicity of the drug, which can be avoided by extending the time of treatment over ten to twelve weeks irrespective of the symptoms; the total amount of emetine in one course should not exceed 0.01 gm. per kilo body weight. For this purpose he advises six daily 1-gr. doses followed by six daily  $\frac{1}{2}$ -gr. ones, making a total of 9 gr., with a maximum safe limit of 12 gr. **Stovarsol** and **Yatren** may then be given, and after the lapse of at least two weeks 3 gr. of emetine bismuth iodide may be given daily for a week, followed by  $\frac{1}{2}$  to  $\frac{1}{3}$  gr. of emetine daily for six days.

The treatment of chronic amœbiasis is dealt with by P. Oury and P. Godard,<sup>8</sup> who advocate the use of emetine, stovarsol, and yatren. H. L. Ratcliffe<sup>9</sup> records the successful treatment of amœbic and other intestinal protozoal infections in both man and monkeys with **Di-hydranol**, one of the higher alkyl-resorcinol compounds, in an olive oil solution or an agar block suspension, 9 to 15 gr. of the drug being necessary for cure in man.

REFERENCES.—<sup>1</sup>*Ann. Trop. Med. and Parasitol.* 1930, July 8, 165 and 177; <sup>2</sup>*Ind. Med. Gaz.* 1931, March, 426; <sup>3</sup>*Trans. Roy. Soc. Trop. Med. and Hyg.* 1930, Nov. 25, 347; <sup>4</sup>*Ibid.* Aug. 8, 187; <sup>5</sup>*Ann. Trop. Med. and Parasitol.* 1930, Aug. 8, 273; <sup>6</sup>*Amer. Jour. Med. Sci.* 1931, April, 553; <sup>7</sup>*Presse méd.* 1931, March 4, 316; <sup>8</sup>*Amer. Jour. Trop. Med.* 1931, July, 285.

#### AMPUTATIONS. (See also GAS-BACILLUS INFECTION.)

Sir W. I. de C. Wheeler, F.R.C.S.I.

'The Sleeve' Amputation.—The reviewer designed this method to meet certain emergency operations with the least possible risk and with a view to the conservation of the longest possible stump. The amputation is performed in a case such as the following: Compound fracture of the middle or lower third of the femur in which gangrene has commenced in the foot and leg. Instead of amputation above the site of fracture, the limb is removed quickly by circular incisions through the knee-joint. The attachments of the soft tissues to the condyles of the femur are separated with a knife and periosteal elevator. The end of the femur is seized with lion forceps and with the aid of the periosteal elevator (the latter working upwards to the line of the fracture) the lower fragment is removed like a cork from a bottle (*Fig. 1*). A sleeve of soft tissue remains behind. The result of a sleeve amputation is shown in *Plate II*. Some cases were referred to in the *MEDICAL ANNUAL*, 1924, p. 17.

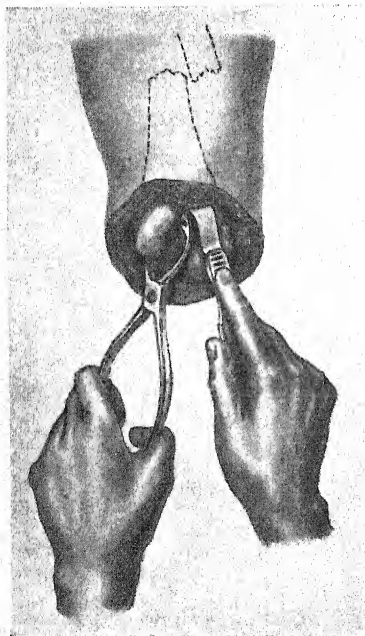


Fig. 1.—The sleeve amputation. Removing the distal fragment of bone.

Amputation is rarely necessary however complicated the fracture, but a considerable amount of limb can be saved if the 'sleeve' method is adopted.

#### Disarticulation at the Hip-joint.

—Hamilton Bailey<sup>1</sup> describes this operation. The patient should be turned

*PLATE II*

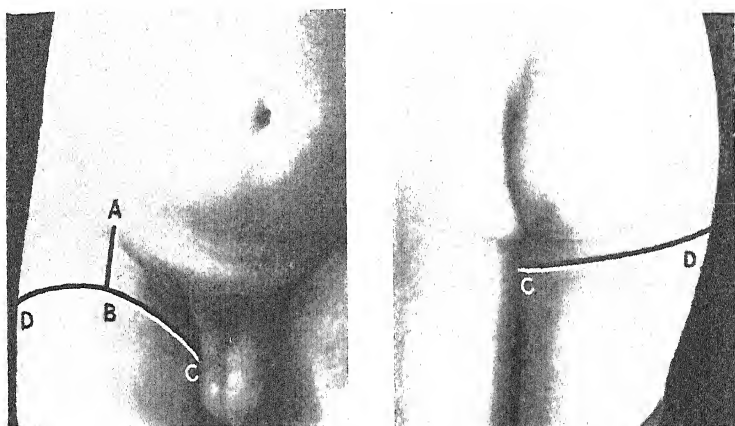
'SLEEVE' AMPUTATION



Result of 'sleeve' amputation for localized septic osteomyelitis and pathological fracture of the femur (middle third).

PLATE III

DISARTICULATION AT THE HIP-JOINT



Incision for amputation at the hip-joint.

*By kind permission from  
Hamilton Bailey's 'Emergency Surgery'*

slightly towards the sound side, with the pelvis at the end of the table. A short (3-in.) vertical incision commencing at Poupert's ligament is carried downwards in the line of the femoral vessels. These are exposed and ligatured. From the termination of this incision below, a circular incision through skin and fascia should be made round the extreme upper portion of the thigh (*Plate III*). The incision passes about 4 inches below the perineum on the inner side and below the base of the trochanter on the outer side. It passes just below the fold of the buttock behind. The skin and fascia are dissected upwards and the muscles divided in circular fashion right down to the bone. The circumflex arteries will require ligation. After some dissection the capsule of the hip-joint is exposed and opened, the head of the femur is dislocated, and the limb removed. The nerves are cut short and the skin-flaps sutured. When possible it is better to divide the neck of the femur with an osteotome and leave the head of the bone *in situ*.

**Amputations through the Middle of the Thigh.**—The best stump will be obtained by a modification of the old method recommended by Watson Cheyne. A mark is made with a scalpel at the back of the thigh at the level of intended bone division. Another mark is made on the front of the thigh above the patella, a point about 6 inches below the first mark. These two points are connected by an incision through skin and fascia passing round the thigh. The skin and fascia are dissected upwards for two or three inches, and then the knife passes through the muscles in front of the thigh, and is carried upwards obliquely through these muscles to the point of bone section. Thus the flap contains more and more muscle. Posteriorly the muscles are divided transversely to the bone. All the soft tissues are forcibly retracted upwards and the bone is divided. The vessels are ligatured and the sciatic and saphenous nerves are cut short. The tourniquet is loosened and any bleeding vessels ligatured in the orthodox manner.

**Problems in connection with Amputations.**—In clearly defined cases such as gangrene, or cases in which the mutilation of the limb makes conservative treatment impossible, the only questions to be decided are the level and the type of operation best suited to the particular case. There are, however, many instances in which a doubt exists. Cases may be divided into those in which immediate amputation is the obvious treatment, those in which preliminary treatment and conservative operations may obviate a high amputation, and cases, especially in children, in which the hope may be reasonably entertained that by prolonged rest and open-air treatment the limb may be saved. Failing the latter result, late amputation is performed with safety. In many cases of injury, delay is justified in order to observe the course of events for a few days or longer.

The War provided a plethora of material which comes under the first category, especially in the case of those suffering from gas-gangrene infection. Commencing gangrene in a diabetic is an example of a condition which benefits by early conservative methods. **Insulin** is employed to reduce the blood-sugar. Under local anæsthesia in the case of the lower limb the femoral vein should be tied. At the same time a Leriche **Peri-arterial Sympathectomy** is performed. By such measures a potentially moist gangrene often is converted into a dry gangrene which may remain confined to the toes and portion of the foot. If the blood-supply to a limb is imperilled as the result of trauma, and it is found that the main artery requires ligature to stop hæmorrhage, the vein also should be tied. The limb below the ligature is supplied with blood during the critical period more abundantly if both artery and vein are secured.

Amputation was considered by the reviewer but abandoned in a case of a large popliteal aneurysm in a man of 62 years. The blood-pressure was 220

systolic. He had a fibrillating heart and pulse-rate of 140. Gangrene of the foot was threatened. The case was treated by resection of a segment of the femoral artery under local anaesthesia, with ligation of the femoral vein. The resection of the femoral artery not only stopped the flow to the aneurysm but provided a radical sympathectomy. To avoid transitory vasoconstriction the adventitious sheath of the vessel was injected with alcohol above and below the two ligatures. The operation resulted in complete cure of the aneurysm. The heart fibrillation ceased and the blood-pressure fell to 180.

Amputation in young people suffering from thrombosis or embolus the result of injury or subacute infection, should not be performed until due consideration is given to the possibility of embolectomy. In the lower limb occlusion not infrequently occurs at the level of the profunda femoris. Pain of great severity is a prominent symptom. The limb becomes wax-like, and pulsation in the vessels below the embolus disappears. Under local anaesthesia the artery is exposed below Poupart's ligament through a long incision. Light rubber-covered clamps are applied to the vessel above and below the level of occlusion. The artery is opened to expose the upper end of the embolus. By milking the vessel from below upwards the embolus is extruded. The wound in the artery is washed with 2 per cent sodium citrate solution and then sutured. When arteries in the upper limb are involved the procedure is much the same. For success, early operation is imperative.

REFERENCE.—*Emergency Surgery*, 1931, ii, 322.

*E. W. Hey Groves, M.S., F.R.C.S.*

*S. J. H. Griffiths, F.R.C.S.*

Road accidents continue to take a heavy toll of life and limb, and it is surprising, therefore, that the literature in the past year contains so little on the subject of amputations. Major Weddell<sup>1</sup> utilizes the experience gained at Queen Mary's Hospital, Roehampton, and sums up the features of a good stump as follows: (1) The stump must be of suitable length for fitting an artificial limb. For above-knee amputations the length of the functioning stump for limb-fitting purposes should be taken from the perineum. For below-knee amputations the limit of useful length is that amount of stump which can be retained in the below-knee socket when the knee is flexed at 90°. The usefulness of a short stump is in inverse ratio to the amount of redundant tissue present. (2) The end of the stump should be covered with skin and subcutaneous tissue only. (3) The scar should be linear, non-adherent, and placed so that there is neither pressure nor traction on it. (4) The skin over the stump should be slack but not redundant. (5) There should be no disease of bone. (6) There should be full range of movement in the proximal joint.

Amputations by transfixion or the guillotine method are counted as obsolete, although it occurs to the reviewers that both still have their sphere of usefulness. The shorter the flaps the better their nutrition; one and a half times the diameter of the limb is generally advised, but this is too long, and the combined length should not exceed the diameter of the limb at the level of the bone. The method of dealing with the periosteum is of little importance, and whether it is dealt with by the aperiosteal, the periosteal cuff, or the osteo-periosteal method seems to matter but little.

Pulling down large nerves and dividing them high up is a frequent cause of post-operative pain and traumatic neuritis. It is better to crush, ligature, and cut the nerve about one inch above the level of bone section and inject the trunk with absolute alcohol. Drainage is advisable in all limb amputations.

The average time for shrinking of the stump is about three months; this can be hastened by applying a firm bandage. Massage of the stump is not

advised except for the purpose of keeping scar tissue from becoming adherent. This early institution of massage is liable to cause irritation in the nerve-ends and subsequent neuralgia. Pylons are not advised as they induce a bad gait, which has to be unlearned when the permanent limb is fitted. [But in spite of this opinion it would seem that they are of use, for they certainly teach balance if not orientation, and they can be fitted with little cost long before it would be advisable to supply a prosthesis.—E. W. H. G.]

In amputations of the *lower extremity* there are only three worth considering: (1) Symes'; (2) Below-knee; (3) Above-knee. The average life of a Symes amputation is eight to ten years. By that time the end pad has been forced laterally and callosities have formed. Neuromatous and circulatory troubles are prone to occur, and re-amputation is generally necessary. Patients who have experienced both Symes and a below-knee prefer the latter. The site of election is now at a distance from the knee-joint so as to leave as near 7 in. of tibia as possible. The old site of election of a hand's breadth below the tubercle of the tibia leaves a stump which is too short for a satisfactory artificial limb, though a controllable knee can be obtained with a 4-in. stump.

In short below-knee stumps the head of the fibula should always be removed, and in the longer ones it should be divided at least 1 in. above the tibia. In the thigh, end-bearing stumps, as elsewhere, are not advisable. The stump of greater length than 10 to 12 in. from the trochanter will surely come to re-amputation—if not through circulatory difficulties, then from fouling of the knee-control mechanism.

In the *upper extremity* conservative surgery is essential, and any part of the hand or fingers must be saved if possible. There is no comparison between any mechanical device and a portion of a finger if the skin and nerve-supply are intact. The thumb alone is worth half a hand, and any portion of it must be saved if possible.

The site of election in the forearm is 6 in. from the tip of the olecranon. Disarticulations at the wrist-joint are unsatisfactory. A forearm stump as short as 2 in. can be fitted with a limb of great utility. In the upper arm the site of election is 7 to 8 in. from the tip of the acromion, and an amputation by equal anterior and posterior flaps is advised.

Burger's fore-quarter amputation is by no means obsolete, and, as pointed out by Sir Cuthbert Wallace, should be considered in cases of carcinoma of the breast with secondary growths high in the axilla. For a painful œdematous arm following radical breast operation a fore-quarter amputation removes a painful useless member.

A. K. Henry<sup>2</sup> and H. Krukenberg<sup>3</sup> have paid some attention to the subject of *kineplastic amputations*. The former quotes two cases where there has been

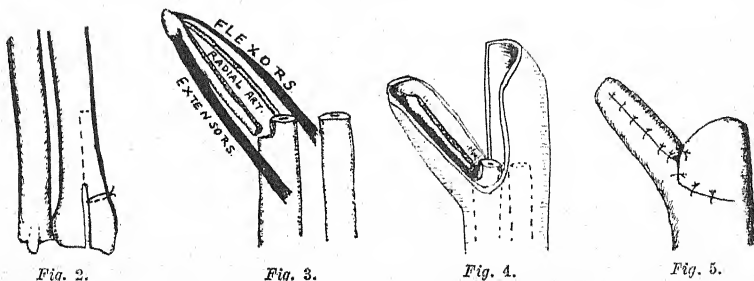


Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Figs. 2-5.—Formation of a prehensile stump. See text. (By kind permission of the 'British Medical Journal'.)

complete loss of the hand and his object has been to make the forearm prehensile. His method is ingenious and the result encouraging. He cuts a 3-in. rod from the radius (*Fig. 2*), to which are attached the flexor and extensor tendons (*Fig. 3*). Two skin-flaps are used—radial and ulnar (*Fig. 4*). The radial skin-flap is sutured round the bone rod and the ulnar flap pulled down and sutured at the base of the new digit (*Fig. 5*). This new digit is allowed to become ankylosed with the shaft of the radius at such an angle that the movement of pronation brings it into contact with an artificial finger attached to a gauntlet fitting the stump.

REFERENCES.—<sup>1</sup>*Jour. R.A.M.C.* 1931, July; <sup>2</sup>*Brit. Med. Jour.* 1931, i, 393; <sup>3</sup>*Arch. f. klin. Chir.* 1931, May, 191.

### ANÆMIA, IDIOPATHIC APLASTIC (*Aleukia Hæmorrhagica*).

*Stanley Davidson, M.D., F.R.C.P.E.*

E. S. Mills<sup>1</sup> divides aplastic anæmia into primary and secondary aplastic anæmia. In the secondary group, which is by far the bigger, are placed the etiological agents, radium, X rays, benzol, and arsphenamine. Idiopathic aplastic anæmia (*aleukia hæmorrhagica*) is, according to the author, a very rare disease. The clinical and laboratory features of sixteen cases derived from sixty-two references, together with two cases occurring in 1930 in the Montreal General Hospital, are reviewed in detail. The author suggests that all the usually recognized methods of treatment failed, but there is some evidence that the treatment by **Raw Foetal Liver** and the injection of 5 min. of **Adrenalin Hydrochloride**, daily, as suggested by Gibson, is worthy of further investigation.

REFERENCE.—<sup>1</sup>*Canad. Med. Assoc. Jour.* 1931, May, 628.

### ANÆMIA, PERNICIOUS.

*Stanley Davidson, M.D., F.R.C.P.E.*

Five years have passed since G. R. Minot and W. P. Murphy,<sup>1</sup> in 1926, issued their epoch-making report on the therapeutic value of the liver diet in pernicious anæmia. Workers in every country in the world have abundantly confirmed their discovery. A sufficient period of time has now elapsed to justify the statement that to-day there exists a specific treatment for pernicious anæmia which is comparable to insulin therapy in diabetes mellitus, or thyroid therapy in myxedema. It is not claimed that liver therapy can produce a permanent cure, but all are agreed that, provided sufficient quantities are regularly taken, the patient will in the vast majority of cases regain normal health and eventually reach his allotted span of years. In analysing the literature concerned with liver therapy, Janet Vaughan<sup>2</sup> states that less than 1 per cent of the cases have died since its introduction, and in all fatal cases severe sepsis was present.

The major problems having been settled, workers have devoted their energies during the past year to finer points regarding the etiology of the disease, the isolation and purification of the specific factor contained in liver, and to new methods of administration of the remedy. In addition, the claims of R. Isaacs and C. C. Sturgis<sup>3</sup> that in hog's stomach tissue we have a substance as effective as, and more economical than, liver, have been amply confirmed.

### ETIOLOGY.

It has been recognized for many years that the two most characteristic features of pernicious anæmia are achylia gastrica and the megaloblastic bone-marrow. While it was strongly suspected that some close relationship existed between the stomach and bone-marrow, it was left to the brilliant work of W. B. Castle<sup>4</sup> and his associates to correlate these findings. Their original



experiments have been carefully reviewed in the MEDICAL ANNUAL, 1930, p. 31. The final instalment in what may be fairly described as the greatest step forward in the etiology of the disease since its original description by J. S. Coombe<sup>5</sup> in 1824, is published in the *American Journal of the Medical Sciences* (1930, Sept., pp. 305-334). The writer recommends this classical paper, not only to hæmatologists, but to all workers who desire to elucidate clinical problems by the method of experimental inquiry.

Pernicious anæmia can now be classified among the deficiency diseases, since a factor is lacking which is essential for the maturation of the megaloblast into the normoblast. We know now, as a result of Castle's investigation, that this factor is elaborated from protein by normal gastric digestion, whereas in pernicious anæmia the process is inadequately performed, thus permitting the development of a virtual deficiency in the presence of a diet adequate for normal individuals. From a series of well-planned experiments he concludes that: (1) The essential constituent (intrinsic factor) of the normal human gastric contents is in all probability secreted by the mucosa of the stomach, and cannot be detected in normal saliva or duodenal contents free of gastric juice, or in the secretions of any portion of the gastro-intestinal tract in a pernicious anæmia patient. (2) This substance is probably organic, thermolabile, possibly an enzyme capable of interaction with protein (extrinsic factor) or closely related substances in neutral solution, resulting in the production of a material having, when administered to pernicious anæmia patients, a marked hæmatopoietic effect. If an enzyme, it is certainly not pepsin; its properties, as so far determined, are only in certain respects similar to those of rennin.

K. Gutzeit and J. Herrmann<sup>6</sup> repeated and confirmed Castle's experiment, using meat incubated with the gastric juice of dogs. These authors claim that a similar reticulocyte rise was obtained when pernicious anæmia patients were fed with meat incubated with 'azidol-pepsin'. It will be remembered that Castle obtained no effects from meat incubated with hydrochloric acid and pepsin. A study of the charts of the reticulocyte, erythrocyte, and hæmoglobin rise in Gutzeit's cases shows an insignificant increase compared with what would be expected to occur from the administration of a potent preparation of the anti-anæmic factor.

The anti-anæmic factor produced as the result of protein digestion in the stomach must be absorbed from the intestinal tract before it can act on the bone-marrow. It is stored in the liver and is also present in the kidneys, whose function apparently it is to stop its excretion from the body. It is obvious, therefore, that any factor which reduces absorption will diminish the amount of circulating anti-anæmic factor. On this hypothesis it is possible to explain the megaloblastic anæmias which occur in persons with apparently normal gastric function, i.e., in sprue, infestation with intestinal parasites, and in tropical intestinal infection, such as dysentery, as reported in a hæmatological study of a series of cases by C. S. Keefer, C. S. Yang, and K. K. Huang.<sup>7</sup> It would also explain the small group of macrocytic anæmias which occasionally follow stricture or chronic obstruction of the small bowel, as a result of new growth or operative interference.

#### ACHLORHYDRIA.

The absence of free hydrochloric acid from the gastric juice is a cardinal sign of pernicious anæmia, and in spite of occasional reports of cases of Addisonian anæmia with apparently normal gastric juice, the reviewer is of the opinion that it is a sound working rule to discard the diagnosis of pernicious anæmia if a trace of acid is found in the test-meal.

The hereditary aspect of achlorhydria in pernicious anæmia has been reviewed repeatedly in the *MEDICAL ANNUAL*. In 1930 Conner studied 154 relatives of 109 patients with this end in view. In 1931 J. F. Wilkinson and W. Brockbank<sup>8</sup> published another series. It can be definitely accepted that the percentage of achlorhydrics in blood relations of pernicious anæmia patients is higher than that found in other sections of the community. The authors discuss the interesting condition of familial achlorhydria unassociated with pernicious anæmia. In one family of four generations, with chronic diarrhœa, three generations were found to be achlorhydric.

In an interesting paper D. T. Davies<sup>9</sup> records his investigations into the relationship of achlorhydria to anæmias of various types. The volume, appearance, mucus, deposit, pH, HCl, and pepsin of the fasting juice, and 10- and 20-minute samples of the gastric contents after histamine injection, were examined in a series of cases. The author found that different degrees of gastric impairment were present in various types of anæmia, the less severe accompanying the simple achlorhydric variety, while complete or nearly complete achylia was present in pernicious anæmia. He suggests that the 'intrinsic factor' of Castle fails when and as pepsin fails.

The return of free hydrochloric acid to the gastric juice, following treatment, is so extremely rare as to warrant the publication of individual cases. One or two cases have been reported in American literature during 1931 (Connery and Joliffe<sup>10</sup>), and one by A. F. Hurst<sup>11</sup> in this country, who suggests that if there exists the possibility that the achlorhydria is secondary to gastritis, and not familial, it is advisable to use gastric lavage, a bland diet, and to remove all infectious foci from the mouth, nose, and throat, with a view to restoring normal gastric digestion and thus producing a permanent cure.

#### DIAGNOSIS.

**Achlorhydria.**—Attention has just been drawn to the importance of achlorhydria in the diagnosis of pernicious anæmia. It should be remembered that many authors believe that this condition is also characteristic of carcinoma of the stomach and of certain types of chronic microcytic anæmia (*see ANÆMIA, SECONDARY*). D. T. Davies and T. G. I. James<sup>12</sup> have therefore done a real service in showing that a high percentage of perfectly healthy persons in the later stages of life secrete no free hydrochloric acid in the stomach, a fact which seriously minimizes the diagnostic value of the test. These workers found that 32 per cent of healthy persons over 60 were achlorhydric. This figure must be reduced to 15 if histamine injection is performed prior to the test-meal. It will be remembered that Bennett and Ryle's figures for normal medical students was 4 per cent.

**Glossitis.**—Another feature highly characteristic, and believed by many to be pathognomonic, of pernicious anæmia, is glossitis. The writer's experience is that only half the cases show this condition, and, further, an identical picture may be seen in certain chronic microcytic anæmias associated with achlorhydria. In short, glossitis may be said to be found associated with achlorhydria rather than with any special blood condition.

**The Neutral Red Test in Pernicious Anæmia.**—In the past all workers have agreed that the injection of neutral red subcutaneously was a satisfactory method of establishing the diagnosis of true achylia gastrica as opposed to achlorhydria, since the dye could never be recovered from the gastric secretion of patients with pernicious anæmia. S. J. Cohen, M. J. Matzner, and Irving Gray<sup>13</sup> report that they recovered neutral red in three cases of pernicious anæmia, but admit the possibility that the dye may have been secreted by the duodenum and regurgitated into the stomach.

**Blood Examination.**—No outstanding discoveries in methods of diagnosis have been made during the past year. Unfortunately, the hopes have not been realized that the diagnosis of pernicious anæmia would become a simple matter as a result of the appearance on the market of various clinical instruments which estimated the mean diameter of the red blood-corpuscle on the basis of the diffraction rings produced when a beam of light is passed through a blood-film. The theories of such *diffraction methods* are sound, but in practice they fail in difficult cases for several reasons: (1) A perfectly spread film is required, and this is far from being the simple procedure which the inexperienced think. (2) The more anæmic the blood and the greater the inequality in size and shape of the cells, the more hazy becomes the diffraction halo and the more difficult becomes the measurement of the diameter of the halo. (3) Price-Jones has shown that the mean diameter of the red cell in a severe case of pernicious anæmia averages  $8.2\ \mu$  compared with a figure of  $7.2\ \mu$  for a normal red cell. In a moderately severe case or during a partial remission the difference in the mean diameter is a fraction of  $1\ \mu$ . This difference alters the size of the halo so slightly as to make a diagnosis extremely difficult, and in the very type of doubtful case of anæmia with a cell-count about three million and a colour index between 0.9 and unity, the method may be little value. (4) The personal factor in measuring the diameter of the colour ring is as liable to error as in estimating the hæmoglobin content or counting the erythrocytes. (5) Lastly, even if the technique is perfect, the only information obtained is in regard to the mean diameter of the cell, whereas it is of equal importance to know the degree of anisocytosis, which is the most characteristic feature of the blood in pernicious anæmia. After a large experience of different methods the reviewer is of opinion that the Price-Jones curve is not only far more accurate than any diffraction reading, but supplies information which cannot be obtained by that method. Unfortunately, the making of a Price-Jones curve is a laborious and tricky procedure which is available only to those constantly working on blood diseases. The general practitioner can rest assured that there is no short-cut to the diagnosis of the anæmias, and that in difficult cases only by a review of every piece of information obtained from the clinical examination, the test-meal, the Van den Bergh reaction, the red-cell, white-cell, and platelet count, the differential and Arneht count, etc., is a certain diagnosis possible.

In routine clinical work reliance is generally placed on a high colour index in the diagnosis of pernicious anæmia. The colour index depends essentially on the average size of the red cell, as well as the hæmoglobin content. Another method of obtaining this information is by measuring the *red-cell volume* as recommended by W. P. Murphy and G. Fitzhugh.<sup>44</sup> These authors describe a simple method by which the average individual red-cell volume may be determined, and give the result obtained from the application of their methods to different types of anæmia. They claim with some justification that this is both easier and more accurate than the determination of the mean cell diameter. For instance, the mean cell diameter in a case of pernicious anæmia may be found by measurement to be only 12 per cent greater than the normal average, while the mean cell volume may be 40 per cent larger. The value of this work requires no further emphasis, but again, unfortunately, it is only available to the specialist. Their final conclusion is of considerable importance. They find that in properly treated cases the cell volume returns to normal, and failure to do so is clear evidence of inadequate treatment.

**Iron Metabolism.**—During the year important work has been done on iron metabolism in pernicious and secondary anæmia. H. H. Riecker<sup>15</sup> studied a series of anæmic patients and found that in hæmolytic anæmias, including

pernicious anæmia, the amount of *blood-serum iron* was greatly increased, whereas it was reduced in the anæmias due to chronic blood loss or dietary deficiency. During a remission the serum-iron content, in cases of pernicious anæmia, fell to normal as a result of an increase of excretion of iron in the stool and urine. The value of the determination of the *iron content of the whole blood* in normal persons and patients suffering from anæmia was examined by W. P. Murphy, R. Lynch, and Isabel M. Howard.<sup>16</sup> They found that the average iron content for 60 normal persons was 42.74 mgm. per 100 c.c. whole blood. A figure called the 'iron index' was calculated by dividing the above figure by the red-cell count in millions of cells per cubic millimetre of blood. The iron index for healthy persons lay between 8 and 9, while in pernicious anæmia the figure was between 10 and 20, depending on the stage of the disease. In secondary anæmias it was normal or subnormal. The authors conclude that the iron index is the most accurate method of distinguishing between primary and secondary anæmias. It has also been found to be an accurate method of estimating the value of different types of treatment. Unfortunately the method requires a considerable amount of biochemical skill and is not available to the clinical worker at present.

#### SUBACUTE COMBINED DEGENERATION OF THE CORD.

Contradictory opinions continue to be expressed by many writers regarding the value of liver therapy in the prevention and cure of central nervous system symptoms. One important fact, however, has gradually emerged during the past year—namely, that cord symptoms are much more liable to appear and are more likely to progress if the blood-level is not kept at normal. This is clearly shown in the reports of P. Starr,<sup>17</sup> E. S. Mills,<sup>18</sup> L. Varga,<sup>19</sup> and others. It is easy to raise the blood-level to between three-and-a-half and four million red cells per cubic millimetre of blood, after which progress is slow and may require intensive treatment. The patient with a relatively high hæmoglobin level feels fit and well, and frequently insists on leaving the nursing home or hospital with a blood-count which is not, and may never reach, a normal level. It is this class of patient from which the future cases of subacute combined degeneration of the cord will be drawn. The lesson of adequate treatment needs no further emphasis.

#### FOCAL SEPSIS.

It is now recognized that focal sepsis does not play a leading part in the etiology of pernicious anæmia, since the essential defect in this disease is an absence of some gastric enzyme. Reference has already been made, however, to the fact that focal sepsis is a potent factor in the prevention of a complete return to normal blood values. The problem which has to be faced by the practitioner when dealing with a case of pernicious anæmia in the severe relapsed stage, in which marked oral or tonsillar sepsis is present, is whether he should recommend immediate eradication of the septic focus, or whether he should leave it alone and proceed with liver treatment. In the reviewer's opinion, where possible no surgical procedure should be undertaken when the patient is severely anæmic, since active liver treatment, even in the presence of the most intense focal sepsis, will usually produce a specific response. The reviewer has seen a 50 per cent reticulocyte response occur in such a case. As soon as the patient is out of danger—and this may be judged arbitrarily by the return of the hæmoglobin level to 50 per cent—eradication of septic foci should be proceeded with, since their evil effects are particularly evident during the late stage of treatment, when blood regeneration normally becomes slow, i.e., during the time when the red-cell count has reached three-and-a-half to

four million, and when great difficulty may arise in forcing the level up the last million.

Some evidence exists that patients with closed sepsis, i.e., deep-seated abscess, fail to respond to liver therapy until the pus is evacuated. The difference between open and closed sepsis must therefore be remembered. Where a surgical emergency is present which demands immediate operation, e.g., acute appendicitis, blood transfusion should be carried out at the end of the operation, and intensive liver-extract therapy by mouth, per rectum, and in the future by parenteral injection, should be started as soon as possible.

#### THE RETICULOCYTE.

Although vital staining methods have been employed for more than a quarter of a century, it is only since the issue by Minot and Murphy of their report on the value of liver in the treatment of pernicious anæmia, in 1926, that they have become routine clinical procedures. It is essential that every practitioner should understand why hæmatologists regard the reticulocyte count as being of primary importance. In simple language the position may be stated shortly, as follows: Vital staining methods, which are extremely easy to carry out, enable the observer to recognize youthful erythrocytes which have recently left the bone-marrow. The essential problem in any type of anæmia is concerned with the ability of the bone-marrow to respond, either naturally to the physiological demands for blood, or in response to treatment. The reticulocyte count is recognized to be the most accurate method of obtaining this valuable information. While vital staining methods have been mainly employed for the recognition of the response of the bone-marrow to liver treatment in pernicious anæmia, they are equally valuable in recognizing the hæmolytic anæmias of the acholuric type, the anæmias resulting from a bone-marrow which is partially or completely exhausted, i.e., the aplastic type, and, finally, in the secondary anæmias as a means of estimating the value of different forms of treatment. This is well demonstrated in the excellent paper by S. R. Mettier and G. R. Minot.<sup>20</sup>

All these practical problems, as well as an experimental investigation into the nature of the basophilic substance of the reticulocyte, are dealt with in detail in a recent communication by the reviewer.<sup>21</sup>

#### ANÆMIA OF PREGNANCY.

1. **Pernicious.**—Dr. Lucy Wills<sup>22</sup> has investigated a series of cases of macrocytic anæmias in women, both pregnant and non-pregnant, in India, in whom the blood pictures were similar to that seen in pernicious anæmia, but in which the gastric secretion was normal and central nervous system symptoms were absent. She names this condition 'tropical macrocytic anæmia', and claims it to be a distinct disease, although frequently associated with pregnancy or complicated by malaria, hookworm disease, etc. The response to **Liver** and liver-extract therapy was excellent.

In the second part of the paper **Vitamin Treatment** of this condition is discussed. Concentrated preparations of vitamin A and C completely failed to produce any improvement, but vitamin B, in the form of marmite, produced an excellent result in twenty-two cases, the effects being quite as good as those produced by liver extract. Since liver is rich in vitamin B the question arises whether pernicious anæmia is a vitamin-deficiency disease. Minot has stated that no known vitamin is lacking in pernicious anæmia. The reviewer has been testing the effects of vitamin B therapy in cases of Addisonian anæmia and in simple achlorhydric anæmia (*Figs. 6-8*). The evidence produced

(*Lancet*, 1931, ii, 1395) is definitely against vitamin B being of therapeutic value in the relapse stage. Further, vitamin B and the anti-anæmic factor contained in liver are almost certainly in no way related. It is possible that

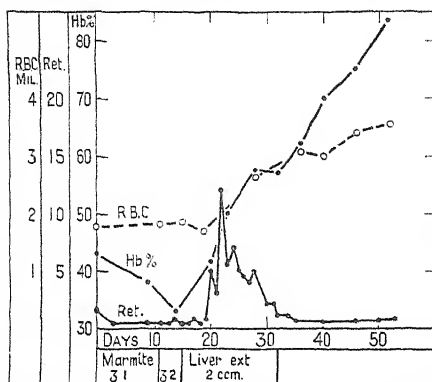


Fig. 6.—Illustrates the failure of vitamin B therapy and the successful results of intramuscular liver-extract therapy in a case of pernicious anemia. 2 c.c. of the extract were injected daily for seventeen days.

Fig. 7.—Shows the failure of prolonged vitamin B therapy and the response to liver and liver extract in a case of pernicious anemia.

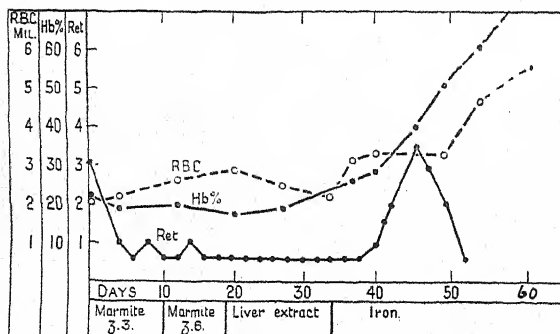
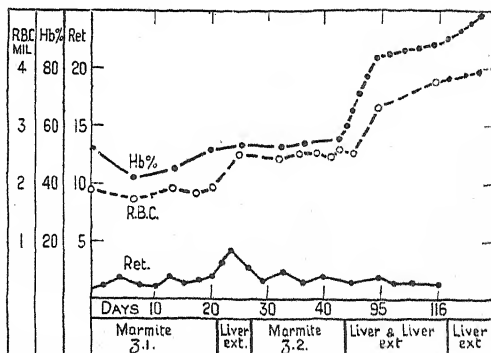


Fig. 8.—Case of simple achlorhydric anemia demonstrating the failure of vitamin B and liver extract therapy. Immediate response was obtained when iron and ammonium citrate, gr. 30 t.i.d., was given.

tropical macrocytic anæmias in India are due to the markedly deficient diet known to be eaten by many Indian women. Vitamin B is known to have a powerful effect in promoting absorption from the alimentary tract, and this

may possibly be its primary rôle in benefiting these anæmic women. Similarly, while impotent to replace liver-extract therapy in the acute stages of pernicious anæmia, it may possibly be of value in reducing the amount of the daily maintenance dose required. The reviewer is at present investigating this aspect.

**2. Chlorotic.**—M. B. Strauss<sup>23</sup> discusses the classification of anæmias associated with pregnancy. The so-called pernicious anæmia of pregnancy may or may not have a normal gastric secretion, and responds well to transfusion and liver therapy. The author describes three liver cases of severe chlorotic anæmia in pregnant women, with complete and persistent achylia gastrica, which responded satisfactorily to **Iron Therapy**.

#### TREATMENT.

**Liver Treatment.**—A classification of the anæmias responsive to liver treatment is made by Janet Vaughan.<sup>2</sup> In an excellent review she discusses how its effects are produced and the principles which govern its administration. Liver extract is as effective as whole liver in one group only—namely, the megalocytic anæmias belonging to the pernicious anæmia syndrome. Whole liver, on the other hand, is of value not only in pernicious anæmia, but in the anæmias secondary to hæmorrhage, and, in conjunction with iron, in the large group of anæmias secondary to deficient dietary. Two separate substances must therefore exist in liver: (1) The specific anti-anæmia factor produced from protein as a result of gastric digestion, which is necessary for normal maturation of the megaloblasts; and (2) Some material effective in clinical and experimental secondary anæmias. Whipple claimed to have isolated such a material, but details are not yet available. Janet Vaughan describes an animal test for the potency of liver extract. The pigeon has a megaloblastic marrow, and the author claims that a definite reticulocyte response follows the therapeutic administration of an active extract. If this work is confirmed, it is of considerable importance, since the reviewer is aware of no satisfactory test for potency, except the trial of an extract on a patient suffering from pernicious anæmia.

The effect of liver extract on the blood of normal persons has been studied by M. P. Crane, Isabel Howard, and W. P. Murphy.<sup>24</sup> The feeding of eight vials daily of liver extract to normal persons produced no striking changes in the blood, and no signs or symptoms of polycythæmia were observed.

**Fish-Liver Extract.**—Six patients suffering from pernicious anæmia were treated with an aqueous extract of fish-liver, by J. E. Connery,<sup>25</sup> who reports that the results hæmatologically and clinically were similar to those obtained with mammalian liver or liver extract. This finding is of considerable interest, since Whipple stated that in animals rendered experimentally anæmic by repeated bleedings, fish-liver was found to be ineffective. If confirmed, it would appear to open up another effective therapeutic remedy for pernicious anæmia, and perhaps be the means of reducing the cost of the manufactured article.

**The Uncertain Potency of Liver Extract.**—The lack of a biological method for standardizing liver extract and preparations of stomach tissues have resulted in many preparations of little therapeutic value being placed on the market. E. S. Mills<sup>18</sup> states that the records of the Blood Clinic of the Montreal General Hospital afford ample evidence of the superiority of raw liver pulp over liver extract, particularly in cases with cord symptoms. Accordingly he advises the use of raw liver pulp instead of extract, particularly if any doubt exists regarding the potency of available extracts.

**Single Massive Doses of Liver Extract.**—Treatment with single massive doses

of liver extract introduced into the stomach by tube have been carried out by J. E. Connery and L. J. Goldwater,<sup>26</sup> and by M. C. Riddle and C. C. Sturgis.<sup>27</sup> From thirty to fifty vials of liver extract in 300 c.c. of water were introduced into the stomach in one dose. In all patients there occurred a prompt reticulocyte response and the anticipated hæmatological and clinical improvements which are known to occur in cases of pernicious anæmia treated with smaller doses over long periods. From these studies it is clear that the response to liver medication depends rather on the total amount of the active principle used during a certain time-period than on the amount consumed each day. A maximal reticulocyte response is rapidly produced, and the clinical improvement is as satisfactory after a single dose of thirty vials of liver extract as when three vials are given daily for ten days. The effect lasts approximately for ten days.

The reviewer has treated a case of pernicious anæmia with massive doses of liver extract (fifteen tubes equal to approximately 4000 grm. of whole liver) passed through a tube into the stomach. In about twenty minutes the patient complained of burning pains in the epigastrium and vomited up the material. A second attempt on the following day was equally unsuccessful. The American workers also experienced to some extent the same difficulty, so that such excessive quantities are obviously badly tolerated, and if the stomach tube method is required for cases with marked gastro-intestinal upset, smaller amounts should be introduced.

Nevertheless a valuable lesson can be learned from these investigations—namely, that the practitioner should make every endeavour to introduce daily by mouth the maximal amount of active principle which the patient can take. It is as economical to give large doses over short periods as to give small doses over long periods, while in the first case the return to health will be much more rapid.

*Intramuscular and Intravenous Liver Therapy.*—Until recently liver extract has invariably been administered by mouth, except in occasional cases with serious vomiting, where an enema per rectum has been tried. It is only in the past year that the active principle has been sufficiently purified for parenteral injection. Cohn, McMeekin, and Minot<sup>12</sup> claim that in the most potent liver preparation given intravenously the action has been increased three-thousand-fold, as compared with liver given orally, and that the active principle cannot be present in this organ in more than a few hundredths per cent. A single dose of 0.15 grm. of such a relatively impure preparation is sufficient to produce a satisfactory remission, which begins within sixty hours of administration. W. B. Castle and F. H. L. Taylor<sup>28</sup> have made an easily prepared extract of liver, Fraction G, suitable for intravenous injection and highly potent in pernicious anæmia. The proteins were removed, so that the chances of producing allergic phenomena were minimal, but the extract was found to have a definite blood-pressure lowering power. If it was injected not faster than 2 c.c. per minute, these results were, however, purely temporary and of no consequence. The amount of extract injected was a little over 0.1 grm. per kilo. of body weight, dissolved in physiological solution of sodium chloride. The solution was so prepared that 20 c.c. contained the amount of material derived from 100 grm. of liver. The authors were astonished at the activity of the effective principle when injected intravenously. A single injection produced maximal reticulocyte crises of 25 per cent on the fifth day in two patients, and a rise in the red blood-cell level of over one million within ten days.

M. Gänsslen<sup>29</sup> describes a potent liver extract for intramuscular administration. The extract is claimed to be so potent that the injection daily of



2 c.c., which is the amount extracted from 5 grm. of fresh liver, is as active as 600 grm. of fresh liver by the mouth. Forty patients suffering from pernicious anæmia were treated with the extract, and the usual dose given was 2 c.c. intraglutally per diem. No failures are reported. Professor V. Schilling,<sup>30</sup> of Berlin, and various other workers have published results confirming the potency of Gäüsslen's extract. Satisfactory effects from intramuscular injection of liver extracts are also reported by French workers (M. Hamburger,<sup>31</sup> and C. V. Aubertin<sup>32</sup>), and by J. F. Wilkinson.<sup>33</sup>

The reviewer has been fortunate in being able to test the value of intramuscular liver extract therapy, through the kindness of Professor Gäüsslen. The material was found to be potent and no local or general reactions occurred. (*Fig. 6*).

The present position regarding intramuscular and intravenous liver extract may be summarized as follows: These preparations have scarcely passed the experimental stage and are only now becoming available to the general practitioner. When available they will only be necessary for cases in the stage of severe relapse, with vomiting and diarrhoea, and with maximal prostration, in which it is impossible to take or retain liver extract by the mouth. For such cases intramuscular and intravenous therapy will be of the greatest benefit. The general use, however, of such methods has potential dangers, and hence the routine treatment in the future will still consist in the administration of the effective principle by the mouth. The essential fact to be remembered by the general practitioner is that maximal doses of this material should be given if satisfactory and rapid results are to be obtained.

A study of the maintenance dose of potent material in pernicious anæmia has been made by R. T. Beebe and G. E. Lewis.<sup>34</sup> The authors agree that the maintenance dose varies in different individuals, but they were able to classify their series of 108 cases into four groups. *Group I* consisted of 64 patients whose red blood-cells continued to remain at a normal level when they took only relatively small amounts of the effective substance, i.e., amounts of extract derived from 100 to 400 grm. of liver. *Group II* consisted of 31 patients who required a large amount of effective material to maintain a normal blood-level, i.e., extract derived from 500 to 1000 grm. of liver. *Group III*, 5 patients whose red cells remained about 20 per cent below normal even with very large amounts of potent liver material and iron. *Group IV*, 8 patients whose red cells and hæmoglobin remained somewhat below normal when large amounts of liver extract were taken, but who obtained a normal blood-level when iron was given, with even a smaller amount of liver extract than formerly. In *Group IV* two types of disordered blood formation were evidently occurring at one time—namely, a deficiency of the specific anti-anæmic factor derived from protein, and, secondly, a deficiency in iron assimilation. The authors next make a careful analysis of the factors which appear to influence the size of the maintenance dose required, and the following very important and interesting points emerge: The average age of the patients in *Group I* was nearly twenty years less than those in *Groups II* and *III*, and the duration of the disease was nearly a year shorter. Low-grade infection, such as chronic bronchitis, pyelitis, and arthritis, etc., occurred in 10.9 per cent, and mild arteriosclerosis was present in 4.7 per cent respectively, of patients in *Group I*. The corresponding figures were considerably larger in *Group II*, while in *Group III* they reached 40 per cent and 80 per cent respectively. From the statistics submitted it is also obvious that neurological symptoms were present in a much higher percentage of cases belonging to *Groups II* and *III* than in *Group I*; and further, that their response to treatment was correspondingly poor. The conclusions to be drawn from this valuable analysis are: That

when pernicious anæmia occurs in an elderly patient, with long-continued chronic sepsis or advanced arteriosclerosis, permanent changes have already occurred which make it difficult, even with massive doses of liver or liver extract, to obtain normal blood figures. It is in such cases that neurological changes are likely to occur and to advance in spite of treatment.

Davies<sup>9</sup> describes a case of pernicious anæmia which has remained well for the past three years on one weekly dose of liver. Free HCl was absent, but some peptic activities remained, and therefore the possibility that some of the specific anti-anæmic enzyme ('intrinsic factor' of Castle) was being secreted could be postulated. The author suggests that the maintenance dose of liver required may be related to the degree of gastric impairment present.

*The Anti-anæmic Factor contained in Liver.*—During the past year considerable advances have been made in the isolation and purification of the specific anti-anæmic factor found in liver. It was a real therapeutic advance when liver extract was first made by Cohn and his associates, since patients seriously ill with pernicious anæmia suffered such severe gastro-intestinal disturbance that it was extremely difficult for them to take adequate quantities of whole liver. These extracts have been further concentrated, and E. J. Cohn, T. L. McMeekin, and G. R. Minot,<sup>35</sup> have so purified the effective principle that they claim that the potency is now three-thousandfold that of liver.

*The Chemical Nature of the Active Principle in Liver Extract.*—R. West and M. Howe (1930) isolated a crystalline derivative of an acid present in liver and active in pernicious anæmia, examination of which suggested the presence of  $\beta$ -hydroxyglutamic acid. Later in the same year these workers along with H. D. Dakin<sup>36</sup> recognized the active crystalline substance as the dipeptide of  $\beta$ -hydroxyglutamic acid and  $\gamma$ -hydroxyproline.

#### Other Remedies.—

*Iron.*—Iron is seldom required in the treatment of pernicious anæmia. In a small group of cases (*Group IV* of Beebe and Lewis) it is a very important adjuvant to liver therapy. Again, when the blood-count has reached five million or over, following liver treatment, the colour index tends to fall, and in such cases iron may be of value. (See also PHARMACOLOGY AND THERAPEUTICS.)

*Hydrochloric Acid.*—The problem whether the routine administration of hydrochloric acid should be given to every patient with pernicious anæmia still remains a vexed question. The underlying rationale of prescribing large doses of hydrochloric acid, as recommended by Hurst and other workers, was the sterilization of the upper gastro-intestinal tract, since it was believed at that time that the abnormal gastric flora which developed in the achlorhydric stomach was an essential etiological factor in the production of the disease. To-day it is recognized that the pathogenesis of the disease lies not in bacterial activity but in enzymic deficiency. The reviewer<sup>37</sup> has shown that the pharmacopœial doses of hydrochloric acid have practically no effect in sterilizing the stomach, and that that organ is achlorhydric once again within one hour of the administration of acid. Any attempt at sterilization should be directed to clearing out septic foci in the nose, mouth, and throat. Liver therapy acts as quickly and as effectively, and the patient regains and retains complete health, as well without acid as with it. For these reasons the reviewer, as well as his colleagues in Edinburgh, Professor Gulland and Dr. Goodall, have given up the routine employment of hydrochloric acid therapy for some years. Hydrochloric acid is, however, a valuable drug in the treatment of vomiting and dyspepsia, and especially of the diarrhœa which is a common complication of the achlorhydric state. One drachm of hydrochloric acid, three times a day, well diluted with water and flavoured with orange juice, often works like

a charm. J. F. Wilkinson and W. Brockbank<sup>38</sup> believe that better results are obtained if **Pepsin** is given in addition. They recommend a mixture of three parts glycerin of pepsin B.P., and one part acid hydrochloric dilute B.P., 2 drachms of which, well diluted with water, should be sipped throughout the meal.

*Thyroid Therapy.*—J. H. Means, J. Lerman, and W. B. Castle,<sup>39</sup> after pointing out that the appearances of patients with myxœdema and with pernicious anæmia may be very similar, describe five cases in which both diseases co-existed. Each disease responded to its appropriate treatment.

*Treatment with Certain Preparations of Stomach.*—A second report on a further series of cases of pernicious anæmia treated with whole chopped hog's stomach, desiccated and defatted with petroleum benzine, is issued by Sturgis and Isaacs,<sup>3</sup> the original discoverers of the value of this form of therapy. The clinical and hæmatological responses obtained were similar and equal to those following liver therapy. Similar results are claimed by workers all over the world, and reports to this effect have been published by H. M. Conner,<sup>40</sup> by Professor I. Snapper and J. D. G. du Preez,<sup>41</sup> by J. F. Wilkinson,<sup>42</sup> by M. Gänsslen,<sup>43</sup> and by others. Both raw and dried preparations give satisfactory results. The problem cannot yet be said to be settled as to which, if any, part of the stomach is most satisfactory, or whether the mucous membrane is superior to the muscular tissue. Conner found all parts satisfactory, while Isaacs and Sturgis obtained no result from the muscular coat, and only a very poor one from the mucous membrane, although the whole stomach tissue produced a typical reticulocyte response in every case. The belief is expressed that there exists in the mucosa an enzyme-like substance similar to that postulated by Castle in the case of human beings, which acts on the protein of the muscular coat when the stomach is being minced and ground up in the fresh state, with the consequent liberation of the active principle necessary for normal blood formation. It is important for practitioners to realize that the desiccated hog's stomach preparations on the market are not extracts; they are insoluble in water and thermolabile, while most liver extracts are soluble in water and all are moderately thermostabile. Stomach tissue may be taken in water, milk, or tomato juice, as a thick purée or as an emulsion, and may be eaten with or between meals.

The dose of desiccated hog's stomach recommended by Isaacs and Sturgis is 10 grm. for every million red blood-corpuscles deficient, while the maintenance dose is roughly 10 grm. daily. The reviewer has been using this dosage for the past eighteen months and can confirm these authors' conclusions.

The efficacy of the treatment of pernicious anæmia with hog's stomach may, therefore, be said to have been established beyond all doubt. The cheapness of this article will probably cause it to supersede in time the more expensive liver preparations. It should always be tried in cases of pernicious anæmia which are not responding well to liver therapy, and it may be used on alternate days with liver and liver extract to reduce the monotony of the liver diet. Lastly, it must be remembered that there are impotent brands of gastric tissue on the market, just as there are ineffective makes of liver extract, and practitioners will be well advised to use only preparations made by the best firms.

#### SUMMARY OF TREATMENT.

The present position regarding the treatment of pernicious anæmia may be summarized shortly as follows: The former complicated diet as originally suggested by Minot and Murphy is now known to be unnecessary. All that is required is a plentiful, well-balanced diet, rich in the foodstuffs shown by Whipple to be of value in blood regeneration—that is:—

1. An adequate daily intake of red meats, green vegetables, and fruit.
2. Liver, either raw pulp or lightly cooked. (The amount required for a case of average severity is about half a pound daily.)
3. Liver extract derived from 500 grm. of whole liver, or desiccated hog's stomach, 10 grm. for every million red cells deficient, is of particular service during the severe relapsed stage. They may be used as a substitute for whole liver during the remission stage, but it should be remembered that whole liver appears to have certain definite advantages over such preparations, and therefore should still be considered as the staple article in the maintenance diet.
4. The maintenance dose of effective principle must be taken for life. It varies in individual cases widely, as already described, but generally speaking, from one and a half to two pounds of liver per week is sufficient. The only criterion on which to judge the maintenance dose is the blood-level. The difficulty in some cases of bringing the blood-level to normal, and the dangers consequent on the failure to do so, have already been discussed.
5. After preliminary treatment with liver, septic foci, if present, should be adequately dealt with.
6. No drugs are required for routine purposes, but in certain particular conditions hydrochloric acid, iron, and thyroid extract may be of service.

REFERENCES.—<sup>1</sup>*Jour. Amer. Med. Assoc.*, 1926, lxxxvii, 470; <sup>2</sup>*Proc. Roy. Soc. Med.*, 1931, May, 929; <sup>3</sup>*Amer. Jour. Med. Sci.* 1930, Nov., 597; <sup>4</sup>*Ibid.* Sept., 305; <sup>5</sup>*Trans. Med.-Chir. Soc. Edin.* 1824, 194; <sup>6</sup>*Münch. med. Woch.* 1931, Feb. 13, 266; <sup>7</sup>*Arch. of Internal Med.* 1931, March, 436; <sup>8</sup>*Quart. Jour. Med.* 1931, Jan., 219; <sup>9</sup>*Ibid.* July, 447; <sup>10</sup>*Amer. Jour. Med. Sci.* 1931, June, 830; <sup>11</sup>*Guy's Hosp.* 1930, Oct., 407; <sup>12</sup>*Lancet*, 1930, ii, 899; <sup>13</sup>*Arch. of Internal Med.* 1930, Dec., 979; <sup>14</sup>*Ibid.* Sept., 440; <sup>15</sup>*Ibid.* 458; <sup>16</sup>*Ibid.* 1931, June, 883; <sup>17</sup>*Jour. Amer. Med. Assoc.* 1931, April 11, 1219; <sup>18</sup>*Canad. Med. Assoc. Jour.* 1931, May, 628; <sup>19</sup>*Münch. med. Woch.* 1930, 1397; <sup>20</sup>*Amer. Jour. Med. Sci.* 1931, Jan. 25; <sup>21</sup>*Edin. Med. Jour.* 1930, Aug., 425; <sup>22</sup>*Brit. Med. Jour.* 1931, i, 1059; <sup>23</sup>*Amer. Jour. Med. Sci.* 1930, Dec., 818; <sup>24</sup>*Ibid.* 803; <sup>25</sup>*Ibid.* Nov., 603; <sup>26</sup>*Ibid.* 1931, May, 609; <sup>27</sup>*Ibid.* 1930, July, 1; <sup>28</sup>*Jour. Amer. Med. Assoc.* 1931, April 11, 1198; <sup>29</sup>*Klin. Woch.* 1930, viii, 2099, No. 45; 1931, No. 7; <sup>30</sup>*Ibid.* 1931, No. 7; <sup>31</sup>*Presse méd.* 1930, xxxviii, 1273; <sup>32</sup>*Bull. Soc. méd. Hôp. de Paris*, 1930, liv, 747; <sup>33</sup>*Lancet*, 1931, ii, 791; <sup>34</sup>*Amer. Jour. Med. Sci.* 1931, June, 796; <sup>35</sup>*Trans. Assoc. Amer. Phys.* 1930, xlv, 343; <sup>36</sup>*Proc. Soc. Exper. Biol. and Med.* 1930, xxviii, 2; <sup>37</sup>*Pernicious Anæmia*, Henry Kimpton, London, 1930; <sup>38</sup>*Clinical Jour.* 1931, Oct. 30, 475; <sup>39</sup>*New Eng. Jour. of Med.* 1931, Feb., 243; <sup>40</sup>*Jour. Amer. Med. Assoc.* 1931, Feb. 14, 500; <sup>41</sup>*Arch. of Internal Med.* 1931, May, 771; <sup>42</sup>*Brit. Med. Jour.* 1931, i, 85; <sup>43</sup>*Klin. Woch.* 1931, No. 7.

## ANÆMIA, SECONDARY.

Stanley Davidson, M.D., F.R.C.P.E.

CLASSIFICATION.—H. Z. Giffin and C. H. Watkins<sup>1</sup> discuss the classification of secondary anæmias on clinical and morphological lines. This excellent paper includes a well-reasoned section on therapeutics. The main points in the classification were, however, reviewed in last year's MEDICAL ANNUAL (p. 27). Under the titles of "Hypochromic Anæmia," "Achlorhydric Anæmia," "Chronic Microcytic Anæmia", "Chronic Chlorosis", "Idiopathic Secondary Anæmia", etc., many papers have appeared during the past twelve months (T. R. Waugh,<sup>2</sup> L. J. Witts,<sup>3</sup> J. D. Adamson and F. H. Smith<sup>4</sup>). A recent paper by D. T. Davies<sup>5</sup> deserves special mention.

The outstanding feature of this type of anæmia is a relatively high erythrocyte count, with a low hæmoglobin percentage. Achlorhydria is present in most of the cases, and the majority of the patients are women below the menopausal age. Chronicity is the keynote of the history, the average duration in Adamson's cases being ten years. An anæmia secondary to organic disease is extremely unlikely to remain unchanged for such long periods. The essential cause of the anæmia is an iron deficiency consequent on a defective diet and an impaired gastric secretion. It must not be forgotten that the iron contained in the average daily diet is only slightly in excess of the body's needs. Any factors

which cause lessened absorption or increased demand, if long-continued, and particularly if the patient is on a diet poor in iron-containing foodstuffs, tend to produce anæmia.

It is an acknowledged fact that the hydrogen-ion concentration of the small intestine plays an important part in the absorption of calcium, phosphorus, and probably manganese. S. R. Mettier and G. R. Minot<sup>6</sup> show that a better absorption of iron takes place if the acidity of the upper part of the small intestine is increased. There is therefore good justification for believing that the achlorhydria present in so many cases is of real etiological importance, since the hydrogen-ion concentration of the upper intestinal tract is raised by the alkaline contents of the achlorhydric stomach. Chronic blood loss from the bowel, excessive blood loss at the periods, repeated pregnancy, chronic infection, and defective dietary, may in addition all play an important rôle in individual cases.

*Chlorosis.*—According to L. J. Witts,<sup>7</sup> during the past seven years only seven females with chlorosis were admitted to Guy's Hospital. In the same period five cases of secondary anæmia in adolescent males for which no cause was found were admitted. The author labels these cases 'chlorosis in males'. Under the title 'late chlorosis', Witts<sup>8</sup> describes thirteen cases of hypochromic anæmia occurring in women beyond the age of 21, for which no etiological cause could be found. Apart from the fact that the test-meal was normal the blood picture and the response to iron treatment were similar to the cases of hypochromic anæmia already referred to. Witts's paper on "Simple Achlorhydric Anæmia" and the Plummer-Vinson syndrome of glossitis, dysphagia, and anæmia were described in last year's MEDICAL ANNUAL (p. 28).

**TREATMENT OF SECONDARY ANÆMIA.**—The term 'secondary anæmia' signifies that the anæmia is secondary to a definite, recognizable cause, no matter how difficult the discovery of the cause may be; in short, the presence of a secondary anæmia is a challenge to our diagnostic skill. While all are agreed that it approaches malpraxis to treat a secondary anæmia without first diligently hunting for and, if possible, treating the cause, it is equally unwise to neglect the treatment of the anæmia while carrying out these procedures. Giffin and Watkins,<sup>1</sup> in an admirable survey of the treatment of secondary anæmias, draw attention to the importance of recognizing obscure organic disease as the cause of secondary anæmia. Chronic recurrent and persistent loss of blood from the gastro-intestinal tract is probably the commonest condition. This may be associated with growths, simple or malignant, and ulcers of the stomach and bowel, with little or no abdominal complaint and with negative X-ray examination. The value of the benzidine test for occult blood in the stools therefore requires no further emphasis. The authors describe the treatment of 120 cases of obscure anæmias of the hæmoglobin deficiency type with **Fœtal Calves' Liver**, which was desiccated and administered in a daily dose equal to 200 to 300 grm. of the raw product. Satisfactory results, on the whole, were claimed for this treatment. Ninety-eight cases, classified by the authors as belonging to the semi-aplastic type of secondary anæmia, were treated with 6 gr. daily of **Beef Bone-marrow**. The results were, however, unsatisfactory, although the authors suggest that the quantity given may have been insufficient.

**Liver Extract.**—Giffin and Watkins, Mettier and Minot, Witts, Davies, and others, are all in complete agreement in regard to the ineffectiveness of liver extract in the treatment of microcytic anæmias of the chronic hæmorrhagic, chronic infectious, or chronic dietary deficiency type. The reviewer has also carefully investigated this problem and is equally satisfied on this point (see Fig. 8). This is a really important contribution to knowledge, since a vast

amount of money is being wasted to-day by prescribing an active principle which can have no possible action except in anemias resulting from a megaloblastic bone-marrow. Mettier and Murphy also show that liver extract has no effect in augmenting the value of iron or whole liver therapy in secondary anæmia.

**Whole Liver Therapy.**—Liver is of some value in the treatment of the chronic hæmorrhagic type of secondary anæmia, as is to be expected from the original researches of Whipple on the experimental hæmorrhagic anemias of dogs. Several workers have stated that liver therapy enhances the value of iron. A study by the writer of the published records on this point shows that this cannot be said to be clearly proved in cases which receive adequate doses of iron, since such cases will show a maximum response without liver therapy. While it is probably a wise procedure to order some liver to be taken as part of a diet which should be rich in factors known to be valuable in hæmoglobin manufacture, this does not mean that it is necessary to force liver feeding on the patient in a manner comparable to the procedure carried out in pernicious anæmia.

**Iron.**—The therapeutic uses of iron have been well reviewed by Witts.<sup>8</sup> The classification of the preparations of iron in order of efficiency are: (1) the ferrous salts, (2) the scale preparations, (3) metallic iron, (4) the ferric salts, (5) organic iron. The majority of workers prefer pil. ferri (Blaud's pill) or iron and ammonium citrate. If the former is selected it must be a fresh preparation, and the pills should be broken up and the material spread on bread as a powder, as a safeguard against the passage of the pill unchanged down the intestinal canal. The scale preparation has the advantage of being taken as a mixture. The minimal daily effective dose is at least twice the pharmacopœial dose—i.e., reduced iron 25 gr., Blaud's pill 30 gr., iron and ammonium citrate 60 gr.

For the past two years the reviewer has used the scale preparation in the form of a mixture containing 30 gr. of iron and ammonium citrate, thrice daily, with excellent hæmatological results. In no case was there any evidence of gastro-intestinal upset—in fact, digestion was greatly improved. Witts, Giffen and Watkins, and others have drawn attention to the fact that in many cases treatment is required for at least two months before satisfactory results are obtained. Moreover, in the simple achlorhydric type of secondary anæmia relapse is likely to occur, unless a maintenance dose of iron is taken. The maintenance dose is roughly one-third of the therapeutic dose. It must not be thought that the only cases which respond well to intense iron therapy belong to the simple achlorhydric type of anæmia. Microcytic anemias due to chronic blood loss or long-continued dietary deficiency, in patients with normal gastric secretion, respond equally well. As a result of the more scientific methods employed for the study of the value of therapeutic agents used in secondary anemias, a real advance in knowledge has been made. Iron, which for the past twenty years had largely fallen into disrepute, due entirely to inadequate dosage, is once again recognized to be a very valuable hæmatinic remedy.

**Hydrochloric Acid.**—Witts has shown that hydrochloric acid has no effect in the treatment of simple achlorhydric anæmia, nor does it enhance the value of liver or iron therapy. Mettier and Minot,<sup>6</sup> in a very interesting paper on the effect of iron on blood formation, have shown that the absorption of iron is influenced by changes in the acidity of the gastro-intestinal contents to some degree. They admit that, from the practical aspect, such changes can be disregarded since all that is required is optimal doses of iron. The conclusion the reviewer has come to is that hydrochloric acid therapy is of little value, except in the treatment of the gastro-intestinal upset, such as flatulence and diarrhœa, which sometimes accompanies the achlorhydric state.

**Diet.**—A well-balanced plentiful diet, rich in the factors known to be of value in the manufacture of hæmoglobin, is all that is required. A reasonable helping of liver, kidney, or red meat, and plenty of green vegetables, should be eaten at two meals daily during the stage of active treatment, and once daily thereafter, to ensure an adequate supply of iron.

**PREVENTION.**—It will be obvious from what has already been written that the most important single factor in the production of many cases of anæmia is an inadequate, badly-balanced diet, defective in the foodstuffs necessary for blood formation. A large percentage of working-class women partake of diet which consists mainly of carbohydrate in the form of bread, scones, cakes, etc., and is grossly deficient in animal protein and green vegetables. Such a diet, if long continued, not merely produces an anæmia *per se*, but if blood is lost through any channel, or red-cell production is poor as the result of toxæmia or infection, it will fail to supply the necessary factors to make up the deficiency. Prevention lies, therefore, more in the butcher's and the greengrocer's shops than in the druggist's store.

REFERENCES.—<sup>1</sup>*Jour. Amer. Med. Assoc.* 1930, Aug., 587; <sup>2</sup>*Arch. of Internal Med.* 1931, Jan., 71; <sup>3</sup>*Guy's Hosp. Rep.* 1931, April, 205; <sup>4</sup>*Canad. Med. Assoc. Jour.* 1931, June, 793; <sup>5</sup>*Lancet*, 1931, ii, 385; <sup>6</sup>*Amer. Jour. Med. Sci.* 1931, Jan., 25; <sup>7</sup>*Guy's Hosp. Rep.* 1930, Oct., 417; <sup>8</sup>*Proc. Roy. Soc. Med.* 1931, March, 7.

**ANÆMIA, SPLENIC.** (See also SYPHILIS.) *John McMichael, M.B., Ch.B.*

In recent years papers on this subject have been numerous. New aspects have been presented, but no subject in medicine is in a more confused state. The problems of splenic physiology and pathology are very ably reviewed by J. W. McNee<sup>1</sup> in his Lettsomian Lectures (1931). After excluding such well-defined clinical entities as the leukæmias, acholuric jaundice, various tropical diseases, etc., we are left with a large group of cases of enlarged spleen with anæmia, to which we apply the term 'splenic anæmia'. Under this generic heading various pathological entities are included, and the final diagnosis depends on the careful analysis of clinical and pathological data. Taking the pathological entities first, we have to consider: (1) The lipoidal group: Gaucher's disease, Niemann Pick's disease, hypercholesterolaemic splenomegaly. (2) Tuberculosis and syphilis of the spleen. (3) Tumours and cysts of the spleen. (4) Splenomegaly resembling the type described by Banti. (5) Splenomegaly of unknown or uncertain origin.

1. In the *lipoidal group* of splenomegalies excessive quantities of the lipid material are stored in the reticulum cells of the spleen. The protoplasm of these cells in ordinary paraffin sections has a foamy appearance like the cells in the wall of the aorta in atheroma. Excessive deposits of cholesterol causing splenomegaly may be found in diabetes and also associated with xanthomata of the skin (S. C. Dyke,<sup>2</sup> B. S. Oppenheimer and A. M. Fishberg<sup>3</sup>). H. W. Baumkauff<sup>4</sup> records cases associated with prolonged obstructive jaundice, and with atheroma of the aorta.

*Gaucher's disease* is very rare, and the enlargement of the spleen is usually enormous. There is nothing characteristic in the blood-picture, but the diagnosis of the disease may be aided by the wedge-shaped patch of pigmentation appearing on the conjunctiva. The disease may affect more than one member of the same family. The lipid concerned is a cerebroside—kerasin (E. Epstein and J. Lieb<sup>5</sup>).

*Niemann-Pick's disease* is closely allied to the above conditions. The lipid deposited is a phosphatide—lecithin. The disease appears before the age of two years and usually very early in infancy. The blood is said to show swollen monocytes infiltrated with lipid, a condition not seen in Gaucher's disease (J. Lait<sup>6</sup>).

2. *Tuberculosis* of the spleen causing splenomegaly is a rare condition. When it occurs it may be associated with anæmia, or, curiously enough, with polycythæmia. The subject was reviewed by Winternitz,<sup>7</sup> who found polycythæmia in 6 out of 26 cases. The diagnosis of the condition is made on the clinical evidence of tuberculosis elsewhere.

*Syphilis*.—H. M. Korns<sup>8</sup> records a case of tertiary syphilis of the spleen, simulating Banti's disease. Such cases are not uncommon (C. Norris, D. Symmers, and L. Shapiro<sup>9</sup>), and from time to time the importance of considering syphilis as a cause of splenomegaly has been emphasized. The clinical picture is exactly the same as that of the Banti group, and the diagnosis may only be made by the presence of other signs of syphilis. Such cases often fail to respond to antisyphilitic treatment until the spleen has been removed.

3. *Tumours and Cysts*.—Dermoid and echinococcus cysts are described. McNee describes a case of hæmorrhagic cyst. Tumours of the spleen are excessively rare. McNee refers to the literature on the subject and draws attention to a case of sarcoma of the spleen with a blood-picture closely resembling pernicious anæmia.

4. *Splenomegaly resembling the Banti Type*.—This is the central point of the splenic anæmia problem and it is still far from solution. If Banti's descriptions are accepted strictly to the letter, then it is difficult to find cases of his disease in this country. There are, however, cases which correspond more or less to the type he described. The disease begins with splenic enlargement, and cirrhosis of the liver develops later. In many cases, however, it may be impossible to tell whether the disease began first in the liver or in the spleen. The anæmia is moderate unless there have been severe hæmorrhages, and leucopenia is almost constant.

In 1929 McNee drew attention to the presence of curious buff-coloured areas in spleens of this type, constituting the so-called 'siderotic nodules'. The significance of these is discussed in the Lettsomian Lectures. They contain crystals and filaments and are probably the end-result of the absorption of hæmorrhages around the ellipsoids which are situated at the termination of the small arterioles in the spleen. The filaments present in these nodules have been taken for fungi (A. G. Gibson,<sup>10</sup> Nanta, and others). Careful studies by H. A. Reimann and T. J. Kurowschin<sup>11</sup> tend to discredit this view, and the histological development of the nodule from a simple hæmorrhage has been worked out by J. McMichael.<sup>12</sup> Recently E. Jäger<sup>13</sup> in Leipzig has been able to reproduce the appearance of the nodule with its filaments by producing prolonged portal congestion in dogs.

Belonging to this group there are some cases of splenic enlargement associated with portal thrombosis. McNee puts these cases in a separate class—thrombophlebitic splenomegaly. Whether portal obstruction can cause splenomegaly is much discussed, but it seems unlikely. Jäger was never able to produce any marked enlargement of the spleen by portal congestion in his animals, and in many cases the spleen was smaller at the end of the experiment. The pathological association of porto-splenic vein thrombosis with splenomegaly is interesting, however, and requires further elucidation.

It seems probable that the splenomegaly resembling the Banti type may occur as a result of various toxic causes. We have indicated above that it may occur in the course of syphilis. The disease known as 'Egyptian splenomegaly' is also closely allied. The latter condition has been carefully studied by G. Serra,<sup>14</sup> who finds that schistosoma infection probably plays a very important part, otherwise the clinical picture and pathological changes show no essential variation from those described by Banti.

5. *Chronic Splenomegalies of Unknown or Uncertain Origin*.—McNee describes



a *simple hypertrophy of the spleen*. Some spleens associated with anæmia may be very large, and yet on examination they show no histological change. The cause of such conditions remains quite unknown. McNee thinks that in such cases the anæmia may be the result of splenic overactivity.

*Reticulo-endothelioses of the Spleen*.—McNee describes several conditions of great enlargement of the spleen in which the essential feature is a great proliferation of endothelial cells and also of giant cells. The sections almost resembled myeloid sarcoma. In several cases of this kind the liver was definitely cirrhotic.

These curious cases are recorded from time to time in the literature. Further classification is at present impossible. H. E. Bock and K. Wiede<sup>15</sup> suggest that they may be tentatively grouped as histiopathic and hæmopathic reticulo-endothelioses. The latter term is applied when the condition is suspected to be allied to leukæmia—with or without leukæmic changes in the blood.

REFERENCES.—<sup>1</sup>*Lancet*, 1931, i, 951, 1009, 1063; <sup>2</sup>*Jour. Pathol. and Bacteriol.* 1928, xxxi, 173; <sup>3</sup>*Arch. of Internal Med.* 1925, xxxvi, 667; <sup>4</sup>*Frankf. Zeits. f. Pathol.* 1931, xli, 14; <sup>5</sup>*Klin. Woch.* 1931, 1601; <sup>6</sup>*Irish Jour. Med. Sci.* 1931, 115; <sup>7</sup>*Arch. of Internal Med.* 1912, 680; <sup>8</sup>*Amer. Jour. Med. Sci.* 1930, clxxix, 811; <sup>9</sup>*Ibid.* 1917, cliv, 893; <sup>10</sup>*The Mycoses of the Spleen*, 1930; <sup>11</sup>*Amer. Jour. Med. Sci.* 1931, 107; <sup>12</sup>*Edin. Med. Jour.* 1931, Jan., 1; <sup>13</sup>*Verhandl. der deut. path. Gesellsch.* 1931, 334; <sup>14</sup>*Centrab. f. allg. Pathol.* 1931, 51, 150; <sup>15</sup>*Virchow's Arch.* 1930, 276.

## ANÆSTHESIA.

J. Blomfield, O.B.E., M.D.

The advantages of using a *basal narcotic* and the various bodies that can be so employed have continued to occupy the attention and endeavours of many persons concerned with anæsthesia during the past year. By a basal narcotic is meant a substance which, administered in bed before the main anæsthetic, renders the patient either unconscious or so nearly unconscious as to be indifferent to, and unafraid of, the true anæsthetic. In addition, the basal narcotic decreases the amount of true anæsthetic required and abolishes or diminishes untoward after-effects. Furthermore, the basal narcotics chiefly used allow effects to be obtained by the comparatively harmless gaseous anæsthetics, nitrous oxide and ethylene, which could otherwise only be brought about by the more poisonous general anæsthetics, ether and chloroform. The modern tendency is to seek to banish both of these from the realms of practical anæsthesia, as indeed chloroform has already been very largely banished. The necessity for the use of large amounts of ether on any one patient has been greatly reduced by the introduction of basal narcosis; and to that extent the introduction is a step forward, for there is no denying the adverse effects of a prolonged inhalation of ether, at any rate in some subjects, whether it is shown by pulmonary or circulatory or other metabolic deterioration.

The most recently introduced substance for procuring basal narcosis is **Nembutal**.<sup>1</sup> This is one of the barbiturates, that series of derivatives of barbituric acid which has already provided useful hypnotics in luminal and veronal, and basal narcotics in amytal and pernocton. Nembutal is sodium ethyl-butyl-barbiturate, and has the advantage over the previously used barbiturates that it produces its effects more quickly and is also more rapidly detoxicated. Consequently, while sleep is induced early, the recovery period after anæsthesia is shortened as compared, for example, with that which follows amytal, and certainly as compared with paraldehyde, which has been a much favoured basal narcotic. J. S. Lundy<sup>2</sup> says nembutal is more sedative than hypnotic, and is less often followed by delirium or restlessness than are the other barbiturates. It is supplied in capsules of 1½ gr., for use by mouth or rectum, and in ampoules containing 7½ gr. in 10 c.c. distilled water for *intravenous* use. The latter method has been most recommended because the dose

can be more accurately estimated for the individual patient than when the drug is given by the mouth. The injection need not be begun until ten minutes before the time of operation. No calculation of dose on a body-weight basis is necessary, the amount injected being determined by the progressive effect observed during injection. The solution should be freshly prepared and quite clear. The patient should be in bed or on the operating table. The injection is made at the rate of about 1 c.c. per minute, a close watch being kept on the patient throughout. The most satisfactory method of judging the dose is by engaging the patient in quiet talk. His response becomes more and more indistinct until without any excitement he falls into a quiet sleep. The dose is the minimum amount needed to get this effect with slow and careful injection. It varied between 3 gr. and  $7\frac{1}{2}$  gr. in 180 patients (Magill). It is well to recall Lundy's dictum concerning barbiturates, that "large doses usually produce striking results and generate enthusiasm that is curbed only during the post-operative period." In other words, the barbiturates in large doses give effective narcosis, but may be followed by violent restlessness or, worse still, by bronchopneumonia; when they are used in small doses for basal narcosis these results are not to be anticipated.

Lundy<sup>3</sup> expresses himself as well satisfied with administration of nembital *by the mouth* as a preliminary to general anaesthesia. He recommends from  $1\frac{1}{2}$  to 4 gr. orally, together with morphine  $\frac{1}{4}$  or  $\frac{1}{2}$  gr. hypodermically, three-quarters of an hour before operation. In a large number of patients this procedure is quite satisfactory, but there is no means of checking the dosage or of foretelling how often the amount given will scarcely suffice to make the patient even sleepy. The anaesthetist should see the patient beforehand and thus have a better chance of judging tolerance, and of ordering a reduced dose for the feeble or placid patient, but an increased one for the highly excitable, alcoholic, or exceptionally big person. Lundy describes the stages brought about by intravenous injection of barbiturates as (1) hypnotic, (2) inebriated, (3) anaesthetic, (4) pre-mortem. After the use of nembital, whether by mouth or by skin, there is remarkable forgetfulness of everything that happened after the drug was given. Even if the patient is restless during the recovery period, when he is quite round he is entirely unconscious of having been restless at all, and is similarly forgetful of all that he said or did soon after the administration of nembital, before its full effect had arrived. It is perhaps too early to make dogmatic assertions as to the value of nembital as yet, for Lundy, who has probably used it more than anyone else, writes on a basis of some 400 cases only, partly intravenous and partly oral; and Magill has used the drug on but 262 patients. The future, however, looks most promising for a convenient and safe basal narcotic in the oral administration of nembital with a small amount of opiate. The variable reaction of individuals to nembital is stated<sup>1</sup> to be especially noticeable in children, who are, generally speaking, more resistant to its action than adults.

**Sodium Amytal** has been used a good deal in *confinements* because of the long duration of its action. H. W. Featherstone<sup>4</sup> says that 15 gr. given intravenously just before full dilatation of the os can be relied on for painless labour in uncomplicated cases even of primiparæ. A good discussion of the effects of barbiturates from a pharmaco-physiological point of view is provided.<sup>5</sup> The advantages of employing intravenous injections of sodium amytal before *spinal analgesia* are pointed out by L. F. Sise<sup>6</sup> and by H. Koster<sup>7</sup>. The dose employed is from 7 to 15 gr. and is injected at the rate of 1 c.c. per minute, the solution being 15 gr. in 10 c.c. distilled water. In the practice of Koster and Kasman no other premedication before spinal injection is employed, and the patient is merely told that it is necessary to take a small specimen of blood from a vein.

Then the amytal is slowly injected, and when the needed condition of sleep with abolished corneal reflex is reached the patient is turned on to his side and the spinal injection carried out. In 3 per cent of the cases there was continuous excitement during the sleeping period, shown by talking or movements of head and arms, the abdomen and lower extremities being rendered motionless by the spinal anaesthesia. There is always some fall of blood-pressure attributable to the amytal, and this drug is to be avoided, therefore, with the weak and elderly. The use of this intravenous injection of amytal to enable nitrous oxide and oxygen to be used without additional ether, even in abdominal operations, is also described.<sup>8</sup>

The pharmacological action of the barbiturates and the logical basis of combining them with *morphia* is fully described by R. M. Isenberger.<sup>9</sup> It is shown that their action is chiefly subcortical, as contrasted with the cortical action of opiates; and the anti-convulsive action of the barbiturates, as seen in counter-acting overdose from cocaine and the like, is also explained pharmacologically. Sodium amytal has little action on liver function, and depresses urinary secretion less than ether. It causes some depression of respiration and of body temperature.<sup>10</sup>

The chief rival to nembutal, among the barbiturates, is likely to be **Pernocton**.<sup>11</sup> Some authorities indeed appear to regard this as the most valuable of this series of drugs. It is the sodium salt of the secondary butyl- $\beta$ -bromallyl barbituric acid. Its action is quicker and more rapidly recovered from than that of amytal and in this respect it resembles nembutal. It is given only intravenously, in doses of 1 c.c. of a 10 per cent solution per minute until sleep comes on. The amount used is generally about 1 c.c. per 12.5 kilo. of body weight of the patient. The injection is to be made about a quarter of an hour before starting the inhalation anaesthetic, and it is best to avoid all preparations of opium as additional preliminaries; atropine may be used with advantage. After operation sleep usually lasts about two to five hours, and restlessness is far less frequent than after amytal. B. Friedlander<sup>12</sup> reports on 1200 cases which gave him complete satisfaction. The absence of any blood-pressure fall due to pernocton is pointed out.<sup>12</sup> B. Capelle<sup>13</sup> states that catastrophes have followed the combination of pernocton and ether, and that as their pharmacological explanation is obscure the association of the two drugs is to be regarded with suspicion.

**Numal**, a modification of somnifene which eliminates the veronal contained in the latter, has been used in about one hundred instances and is regarded with favour. It is given in the same manner and dosage as pernocton.<sup>14</sup>

**Luminal**,<sup>15</sup> which is phenobarbital, is recommended as a basal hypnotic to be given by the mouth, starting on the evening before operation. It is noteworthy that Lundy recommends this process when nembutal is used by the mouth. In the case of luminal, 10 gr. are given at 9 p.m. on the evening before operation. If the patient is not drowsy in the morning, half this dose may be repeated two hours before operation. Other authorities give 15 gr.<sup>16</sup> in warm milk three hours before operation. It is stated that no fatality due to luminal alone is on record and that up to 35 gr. have been safely given.

**Avertin** continues to hold its place as one of the best basal narcotics, probably the best for those who prefer the rectal to the venous route for injection. The latter method, by the vein, has been tried also with avertin and is warmly supported by Professor M. Kirschner, of Tübingen.<sup>16</sup> This authority describes *intravenous avertin* as "one of the best controllable methods of anaesthesia which we have", because further conveyance of the anaesthetic to the tissues can be immediately stopped by introducing no more, and because recovery is rapid. Induction of unconsciousness by this mode is quick, and

the dose is regulated, exactly as with intravenous nembital, not on any body-weight scale but purely by observation of effect. Directly the patient sleeps the injection is stopped. Kirschner has conducted 750 administrations, and has record of about 2000, and declares that there is no history of mishap or inconvenience. In 160 of his cases the avertin was used alone, in the rest it was followed by ether. He does not recommend it as a sole anæsthetic, but purely as a rapid, safe, and effective induction agent, although for short operations the anæsthesia thus induced is sufficient. The only drawback he mentions is local venous thrombosis, which happens in some 3 per cent of instances.

Another German authority, Professor E. W. Baum,<sup>17</sup> claims that by proper use of rectal injections all the advantages attributed by Kirschner to the venous route can be obtained with avertin. His method consists in washing out the rectum immediately sleep overtakes the patient. Half of the injected avertin is absorbed, says Baum, within the first ten minutes, and of 100 patients 96 were asleep within a quarter of an hour, and the rest within another seven minutes. In some 400 cases<sup>18</sup> avertin has been used in conjunction with magnesium sulphate injection and narcofen, the doses of the latter being about 30 c.c. of 10 per cent solution and 0.03 gr. respectively. The author is so satisfied with the result that the method is his first choice for head and neck operations, and for all highly nervous patients. *Avertin in gynecology*<sup>19</sup> is regarded as a safe anæsthetic which in over 75 per cent of the cases leads to greatly reduced inhalation of ether, with minimal post-operative weakness and pulmonary complaint. The duration of the effect of avertin is said to be enhanced by giving the injection in a milk solution.<sup>20</sup> For all operations on the brain and spinal cord avertin has proved highly successful.<sup>21</sup> The profound modification of the action of avertin which is produced by using morphia concurrently is insisted on by F. E. Shipway.<sup>22</sup> The combination should be reserved, he holds, for the highly nervous and the alcoholic.

In consequence of two instances of alleged *explosion of chloroform vapour*,<sup>23</sup> investigations were carried out which proved the truth of the commonly held view that chloroform vapour is *not* inflammable. Exposed to great heat or to flame, the vapour decomposes into pungent, acrid, black fumes; it does not flare or explode. The reported explosions are attributed to inadvertent admission of ether, or to the burning of combustible gases arising from charred tissues within the mouth.

Strong claims are put forward for the value of an injection of *Eserine*<sup>24</sup> in individuals who are resistant to the effect of general anæsthetics. The author maintains that by testing the effect of pressure on the eyeballs in retarding the pulse or not, it can be foretold whether the patient is easy or difficult in his reaction to anæsthetics. When this pressure causes slowing of the pulse the patient is easily overcome with anæsthetics; when no slowing, or actual quickening, of the pulse is produced by pressure on the eyeball, then the patient will be resistant to anæsthetics. To this class of person  $\frac{1}{2}$  mgrm. salicylate of eserine is given by hypodermic injection and the resistance is at once overcome!

The advantages of *Ethylene*<sup>25</sup> over nitrous oxide are pointed out, and it is stated that researches are going on with the object of eliminating the objectionable smell of the gas. This smell appears to be due to decomposition, the prevention of which it is hoped to achieve. Freed from its objectionable smell, ethylene should find a wide field of usefulness.

The beneficial effect of *spinal analgesia*<sup>27</sup> in producing strong contraction of the circular fibres of the *uterine muscle* is pointed out. When this method is employed for Cæsarean section, the contraction of the muscle of the uterus is so forcible that little blood is lost even if the uterus is opened over the

placental site. After the effect has passed off it may be necessary to use pituitrin when the uterus relaxes. A 5 per cent solution of tropacocaine in normal saline was used, of which from 1.75 to 2.25 c.c. were injected into the second lumbar space, and very little cerebrospinal fluid was allowed to escape.

It is affirmed that **Codeine**, either by the mouth or by hypodermic injection,<sup>28</sup> is the best drug for the preliminary medication of very young children. In doses of from  $\frac{1}{8}$  to  $\frac{1}{2}$  gr. it is the agent to be chosen before operation on infants from six months to two years of age. For older children the administration of **Paraldehyde by the mouth** has been successful, syrup of orange being used to hide the unpleasant taste. Paraldehyde by the rectum has long been a favourite method for children—one drachm per stone of body weight—and many anaesthetists use avertin on young children with good results.

The tone of the peripheral arteries can be well estimated by accurate recording of the warmth of the skin supplied through them, and this has been employed for estimating the effect of anaesthetics on the blood-pressure.<sup>29</sup> The investigations showed that ether and numal raised the skin temperature, lumbar anaesthesia raised that of the legs, and local anaesthetics had no effect. A discussion on the choice of anaesthetic for various kinds of cases is to be found,<sup>30</sup> and it explains that basal narcotics find wide favour, as do the spinal and the endotracheal methods, for selected operations.

F. Sanvenero<sup>31</sup> pleads strongly for the use of **Acetylene** as being superior to the other gases in the depth of narcosis produced and ease of administration.

For removal of *impacted molars* the sitting position and anaesthesia by a mixture of 80 per cent ethylene with 10 per cent oxygen and 10 per cent carbon dioxide is confidently recommended.<sup>32</sup>

A study of the *fœtal heart* during labour, experimental and clinical,<sup>33</sup> has led to the conclusion that there is a tendency to fœtal anoxæmia during anaesthesia in labour and that there is a need for a high carbon dioxide tension in the fœtal blood at birth. Intermittent pressure on the cord tends to interrupt delivery of oxygen from mother to child, and anaesthetic drugs reduce oxygen tension in the maternal blood. Fœtal heart-rate is the guide as to the presence of anoxæmia in the unborn child. A large excess of oxygen given to the mother during the relaxed phase of the uterus will sufficiently build up the oxygen content of the fœtal blood, and the long interruption of oxygen delivery via the cord during uterine contraction will not be noticeable. Inhalation of oxygen-rich atmospheres by the mother is recommended throughout the first and second stages of delivery whenever anoxæmia is indicated by the fœtal heart-rate.

As an anaesthetic injection to be given during the first stage of labour this formula has been found successful<sup>34</sup> :—

R	Isopropyl allyl barbiturate	1 grm.	Olive oil	1½ oz.
	Ether	2½ oz.	Quinine	20 gr.

The injection is made slowly between uterine contractions. Analgesia lasting ten to fifteen hours was obtained.

Leduc's *electric anaesthesia*<sup>35</sup> continues to receive attention. It is claimed that both general and local anaesthesia may be obtained by a direct current of some 30 volts which is interrupted at the rate of 4000 to 5000 times a minute.

A new method of procuring anaesthesia by *intraperitoneal injection of a 33½ per cent solution of Ethyl Alcohol*<sup>36</sup> has been tried experimentally and clinically employed. A fine cannula with pointed end is pushed slowly through the abdominal wall, just as for draining ascites, until the point having passed through the fascia is felt to be free in the abdominal cavity, when the cannula is pushed in firmly. No damage has ever been done to any viscus. If the

operation is not an abdominal one, the cannula is left in position till the end of the operation.

The decrease in lung volume occasioned by opening the abdomen<sup>37</sup> has been proved by X-ray pictures, and is said to correspond closely with the 50 to 75 per cent reduction in vital capacity after an abdominal operation. The recommendation is made that spinal anaesthesia cases should receive carbon-dioxide inhalations periodically throughout the time of operation, that morphine should be employed to lessen post-operative abdominal pain, that atropine should be used after operation, and that frequent changes of position in bed and deep-breathing exercises should be carried out as routine.

An excellent critical and descriptive justification of *spinal analgesia* (Fig. 9) with special reference to operations *above the diaphragm* is given by Dickson Wright.<sup>38</sup> The only contra-indications he admits are: (1) Increased subarachnoid pressure; (2) Septic conditions of the spinal column itself; (3) Perforation of

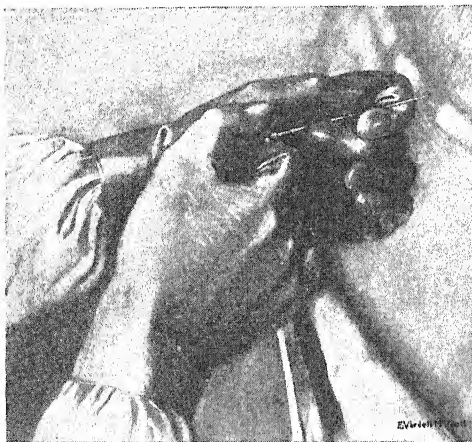


Fig. 9.—Technique of spinal injection (Deavers and Eckels).  
(By kind permission of the "New England Journal of Medicine.")

the small and large intestines. The head-down position and intravenous adrenalin he regards as absolute preventives of fatality. **Novocain** is the drug he prefers and he states that doses over 500 mgrm. (8 gr.) almost invariably produce total anaesthesia no matter what the strength or specific gravity of the solution used or the point of injection or the position of the patient. B. Rapoport,<sup>39</sup> describing two deaths with spinal analgesia in a series of 1875 cases, says that both might have been avoided, and believes that every fatality from this form of analgesia is avoidable and is to be attributed to a mistake on

the anaesthetist's part as to dose or technique, or to unfitness of the patient.

Spinal analgesia with **Percaine** is especially recommended by Torrance Thomson<sup>40</sup> for the "healthy wiry young man with strong abdominal muscles who is suffering from a gastric or duodenal ulcer requiring operation". In a series of 538 unselected cases the effect of spinal anaesthesia on post-operative complications is described as disappointing. No evidence showed any lessening of complications in the respiratory system in elderly and debilitated patients.<sup>41</sup> The case is reported of a child in whom some 250 c.c. of a  $\frac{1}{2}$  per cent percaine solution produced coma for about twenty-two hours. Perfect recovery followed.<sup>42</sup>

A new local anaesthetic, **Pantocaine**, has given great satisfaction in 1200 injections and in 1000 cases of surface analgesia of urethra and larynx.<sup>43</sup> Also another new preparation, **Larocain**, is lauded for its efficiency and safety either for local injection or surface analgesia.<sup>44</sup> F. I. Harris and E. Bolze<sup>45</sup> declare that the height of anaesthesia obtained by spinal injection is directly proportional to the volume of cerebrospinal fluid used as a diluent of the novocain crystals. By withdrawing 10 c.c. of the fluid to dissolve 200 mgrm.

they get anæsthesia to the nipple line, and the duration of this will vary with the amount of novocain used; 300 mgrm. will last for three hours, 200 mgrm. for two only.

Sound advice on the use of *local anæsthetics* is given by C. G. Corlette,<sup>46</sup> who lays stress on the necessity for a quiet psychical state in the patient for whom local methods are employed. In order to secure this he has used **Morphine** and **Hyoscine** a great deal, and has arrived at these rules of dosage:—

1. To patients at 7 years of age give hyoscine 0.43 mgrm. ( $\frac{1}{150}$  gr.) and morphine 3.2 mgrm. ( $\frac{1}{20}$  gr.) an hour before operation.

2. To patients at 17 years of age give hyoscine 0.65 mgrm. ( $\frac{1}{107}$  gr.) and morphine 16.0 mgrm. ( $\frac{1}{4}$  gr.) an hour and a half before operation, and again hyoscine 0.43 mgrm. ( $\frac{1}{150}$  gr.) and morphine 8.0 mgrm. ( $\frac{1}{8}$  gr.) half an hour before.

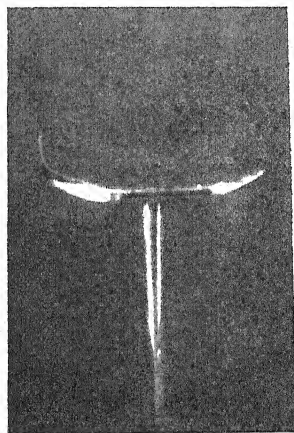
3. To patients at 20 years of age give full dosage, i.e., hyoscine 0.65 mgrm. ( $\frac{1}{107}$  gr.) and morphine 22 mgrm. ( $\frac{1}{4}$  gr.) an hour and an half before, and hyoscine 0.43 mgrm. and morphine 11.0 mgrm. ( $\frac{1}{8}$  gr.) half an hour before, operation. After the age of 35 the second dose of hyoscine is omitted.

4. To patients at 50 years of age and up to extreme old age give 0.43 mgrm. hyoscine and reduce the morphine to gr.  $\frac{1}{4}$ . In very old people reduce the morphine to gr.  $\frac{1}{4}$ .

The patient is placed on the operating table soon after the first injection has been given. The table must be well padded. The eyes are covered, light is reduced, and strict quiet maintained. Before arranging towels, etc., bandage the wrists to the table in such a way that while comfortable they yet can not be lifted so as to interfere accidentally with the asepsis of the operation. The injection of the local anæsthetic except for small areas is done before the arrangement of the towels and the final preparation of the skin. Corlette uses novocain from  $\frac{1}{2}$  to 2 per cent and with it adrenalin from 1-75,000 on head and face to 1-200,000 for all parts of the body below the clavicle. In operating for toxic gastritis adrenalin is omitted, or used in dilution of 1-500,000.

*Intravenous local anæsthesia*<sup>47</sup> is a valuable method for operations on limbs. Experimental observations show that after thirty-five minutes the injected dose of novocain has become innocuous. Therefore after that time the tourniquet can be safely removed. On experimental evidence doses of 28-35 gr. for an adult of 9 stone can be used; in practice the maximum dose injected was 5 gr., so that the margin of safety is great. Apparently as much as 3 $\frac{1}{2}$  gr. can be injected direct into the blood-stream without danger, which is consoling knowledge in view of possible accidental entrance into a vein when using ordinary local analgesia. The usual dose for intravenous anæsthesia is about 10 c.c. of 2 per cent novocain for an adult upper limb.

To overcome difficulty sometimes caused by thick skin to a fine needle in making spinal injections, a little instrument has been introduced by H. F. Graham<sup>48</sup> called the spinawl (*Fig. 10*). It has a triangular point with sharp cutting edges, is easily inserted, and leaves a tiny opening through the skin.



*Fig. 10.*—The spinawl. (By kind permission of the 'American Journal of Surgery'.)

The pin is  $1\frac{1}{4}$  in. long and tapers from top to bottom; it is easy to control and direct. A small-calibre spinal needle, with short bevel, is passed through it into the spinal canal.

In order to combine the quick action of novocain with the long-lasting effects of percaine, and to avoid the turning on the face needed with injection of the latter, a mixture of the two is recommended for spinal injection when a long analgesia is desired. The author with his experience of 140 cases is highly satisfied with his results. The syringe containing the novocain-percaine mixture is attached to the spinal needle, and enough fluid allowed to flow into it to bring the total bulk to 2 or  $2\frac{1}{2}$  c.c., depending on height of anaesthesia required, force of injection, etc.<sup>49</sup> The possible dangers of spinal injection from local trouble in the cord are often doubted, and it is therefore important to note records of definite cases of meningitis and of transverse myelitis.<sup>50</sup>

REFERENCES.—<sup>1</sup>*Lancet*. 1931, i, 74; <sup>2</sup>*Proc. Staff Meetings, Mayo Clinic*, 1929, iv, 386; <sup>3</sup>*Anæsthes. and Analges.* 1930, Sept.-Oct. 210; <sup>4</sup>*Proc. Roy. Soc. Med.* 1931, May, 864; <sup>5</sup>*Amer. Jour. Surg.* 1930, July, 110; <sup>6</sup>*Ibid.* 65; <sup>7</sup>*Med. Jour. and Record*, 1931, Feb. 18, 167; <sup>8</sup>*Calif. and Western Med.* xxxiii, No. 4, 712; <sup>9</sup>*Amer. Jour. Surg.* 1930, July, 35; <sup>10</sup>*Surg. Gynecol. and Obst.* 1930, Sept.; <sup>11</sup>*Amer. Jour. Surg.* 1931, March, 485; <sup>12</sup>*Brit. Med. Jour.* 1930, ii, 902; <sup>13</sup>*Deut. Zeits. f. Chir.* 1930, Dec. 354; <sup>14</sup>*Med. Press*, 1931, Jan. 18, 143; <sup>15</sup>*Canad. Med. Assoc. Jour.* 1931, May, 671; <sup>16</sup>*Arch. f. Klin. Chir.* 1930, Nov. 361; <sup>17</sup>*Zentralb. f. Chir.* 1930, July 26, 1848; <sup>18</sup>*Munch. med. Woch.* 1930, Aug. 1, 1312; <sup>19</sup>*Edin. Med. Jour.* 1930, Sept. 130; <sup>20</sup>*Canad. Med. Assoc. Jour.* 1930, Oct. 507; <sup>21</sup>*Jour. Amer. Med. Assoc.* 1931, May 30, 1860; <sup>22</sup>*Clinical Jour.* 1931, March 18, 123; <sup>23</sup>*Brit. Med. Jour.* 1930, ii, 312; <sup>24</sup>*Presse méd.* 1930, Oct. 8, 1365; <sup>25</sup>*Proc. Roy. Soc. Med.* 1930, May 2, 1259; <sup>26</sup>*Surg. Gynecol. and Obst.* 1930, Aug. 30, 217; <sup>27</sup>*Brit. Med. Jour.* 1930, ii, 676; <sup>28</sup>*Canad. Med. Assoc. Jour.* 1930, Nov. 672; <sup>29</sup>*Deut. Zeits. f. Chir.* 1930, Dec. 365; <sup>30</sup>*Brit. Med. Jour.* 1931, Feb. 14, 265; <sup>31</sup>*Arch. ital. di. Chir.* 1930, xxiv, 717; <sup>32</sup>*Anæsthes. and Analges.* 1931, Jan.-Feb. 44; <sup>33</sup>*Ibid.* March-April, 61; <sup>34</sup>*Ibid.* 64; <sup>35</sup>*Zeits. f. Fleisch- u. Milchkhyg.* 1928, 39, 21-22; <sup>36</sup>*Wien. klin. Woch.* 1930, Oct. 11, 1284; <sup>37</sup>*Anæsthes. and Analges.* 1931, May-June, 126; <sup>38</sup>*Proc. Roy. Soc. Med.* xxiv, No. 2, 617; <sup>39</sup>*N.E. Jour. of Med.* 1931, June 11, 1258; <sup>40</sup>*Edin. Med. Jour.* 1931, April, 49; <sup>41</sup>*Surg. Gynecol. and Obst.* 1931, April, 898; <sup>42</sup>*Zentralb. f. Chir.* 1930, No. 30, 1868; <sup>43</sup>*Ibid.* 1931, May 9, 1199 and 1116; <sup>44</sup>*Ibid.* 1931, March 7, 591; <sup>45</sup>*Calif. and Western Med.* 1930, Sept. 652; <sup>46</sup>*Med. Jour. of Australia*, 1931, Feb. 7, 159; <sup>47</sup>*Brit. Jour. Surg.* 1931, April, 641; <sup>48</sup>*Amer. Jour. Surg.* 1931, March, 557; <sup>49</sup>*Ibid.* 471; <sup>50</sup>*Ann. of Surg.* 1931, April, 929.

## ANGINA, AGRANULOCYTIC. (See AGRANULOCYTOSIS.)

### ANGINA PECTORIS AND CORONARY ARTERY DISEASE. (See also SYMPATHETIC NERVOUS SYSTEM, SURGERY OF.)

A. G. Gibson, M.D., F.R.C.P.

Some interesting facts are stated by L. A. Conner<sup>1</sup> in a symposium on the problem of coronary artery disease. In an investigation of 287 patients, in 3 per cent the disease occurred before 35 years, in 11 per cent from 41 to 45 years, and in 22 per cent from 50 to 60 years. The total duration of life after the first attack varied from three months to seventeen years, and two-thirds of the cases were dead within six months of being seen: 60 per cent of patients died following severe attacks, and 10 per cent from mild attacks. As many as seven attacks were noticed in one patient.

In the same discussion W. S. Thayer emphasized the value of prolonged Rest; indeed, the prognosis in this disease has somewhat altered from the beneficial effects of treatment. This rest is necessary as much for the benefit of the cardiac muscle as to enable the patient's needs to be mentally adjusted to his physical state. This mental training is best done by putting the patient to bed for several weeks.

L. Levin<sup>2</sup> reviews 134 cases of *precordial pain*. He makes the classification into: (1) Angina pectoris; (2) Coronary occlusion; (3) Non-paroxysmal organic pain other than coronary occlusion; and (4) Non-organic pain. A large



proportion of patients with angina pectoris had one or more abnormal physical signs such as weak or abnormal heart-sounds, systolic murmurs, arteriosclerosis, hypertension, cardiac enlargement, and abnormal electrocardiograms. Most of the cases were treated with one of the xanthine derivatives, either **Theobromine** or **Ethylenediaminetheophyllin**. In the case of angina pectoris good results were reported in 53.5 per cent, whereas in coronary occlusion 35 per cent showed good results.

R. L. Levy<sup>3</sup> describes eight cases, one in a female, showing *mild forms of coronary thrombosis*. All the patients were under 50 and showed a rapid recovery. Even though the symptoms at the onset were severe, the patients were never confined of necessity to bed, and several of them considered themselves well in from twelve hours to ten days. Disobedience to the physician's warning against resumption of activity did not result in any disaster. In no case was any syphilitic taint discovered. Six of the eight patients smoked tobacco in excess.

H. Blotner<sup>4</sup> draws attention to the frequency with which coronary artery disease affects patients with *diabetes*. It occurred in 45 per cent of post-mortems as compared with 21 per cent in a non-diabetic group of cases up to 40 years of age. Two-thirds of the patients had some cardiac symptoms before they had come under observation, and in 43 per cent of all the diabetic cases death was attributable to heart disease.

O. S. Randall and T. G. Orr<sup>5</sup> describe two cases of *coronary occlusion that occurred after operation*. The first case, a man of 58, operated on for a double inguinal hernia, collapsed on the fourth day after the operation after raising himself slightly in bed. A post-mortem showed that the right coronary artery was plugged with an embolus. The second case, a male aged 60, operated on for epigastric discomfort following an accident which had resulted in an umbilical hernia, died suddenly on the eleventh day after operation. The authors make a plea for a more careful study of the cardiac history of patients undergoing operation, so as to exclude those with coronary artery disease. It is doubtful, however, whether under the ordinary circumstances of practice a suspicion of coronary artery disease would prevent the undertaking of necessary operations. The reviewer has seen an example of an operation performed on a man the subject of ischaemic necrosis who died subsequently from a different complaint, the serious condition of the heart never having been suspected. This paper, however, does raise the question of the general suitability of patients in the later middle life for operation, and coronary sclerosis is not the only danger. There can be no doubt that a careful examination of the whole cardiovascular system, including an electrocardiogram, enables those in charge of a case to assess the risk of operation more truly.

J. E. Cottrell and F. C. Wood<sup>6</sup> relate an experience on the suggestion made by Levine, Ernestere, and Jacobson that *injections of epinephrin* might be used as a means of differentiating between true angina pectoris and conditions associated with similar pain (see MEDICAL ANNUAL, 1931, p. 40). Their paper records the case of a Jewess in whom the injection of epinephrin was followed by symptoms suggestive of myocardial infarction with persistent damage.

Five case records reported by J. Parkinson and D. E. Bedford<sup>7</sup> tend to show that *from the electrocardiographic point of view* attacks of true angina are accompanied by changes in the myocardium, which suggest that the origin of the pain is there and not in the aorta as was suggested by Allbutt and later defended by Wenckebach. There was a depression of the RT period and a diminution in the amplitude, or inversion, of the T waves in one or more leads; changes such as are seen in the early stages following cardiac infarction. After the paroxysm there is a return to normal. From this evidence they believe

that the mechanism underlying this change is the same as that in coronary thrombosis—namely, ischæmia of part of the cardiac muscle.

F. C. Wood and C. C. Wolferth<sup>8</sup> discuss the *nature of the attack in angina pectoris* and compare the electrocardiographic phenomena with the effects of experimental temporary occlusion. The coronary hypothesis of the anginal attack as first enunciated by Parry depends on the following facts: (1) Frequency of coronary artery disease in patients who have died from angina pectoris; (2) The similarity of angina pectoris with the effects of coronary occlusion, especially in regard to the character and location of the pain; (3) The explanation of sudden death from ventricular fibrillation. The aortic hypothesis as enunciated by Allbutt and Wennebach rests on the fact that the changes would appear to be in the heart muscle, and that the coronary phenomenon of a drop in blood-pressure and signs of heart failure are not parts of the anginal attack. Patients have died from angina pectoris but have shown no coronary disease post mortem, though all showed aortic disease. Other aortic disease such as rupture and aortitis produces pain similar to angina.

Thirty cases of angina pectoris were studied on the electrocardiograph after inducing attacks by exercise. The experience of the authors induces them to say that this method is not recommended as a means of diagnosis, and although no untoward occurrences were seen they look upon it as dangerous to provoke attacks indiscriminately. Of 30 cases of angina, 15 showed temporary ventricular complexes during the pain, probably not to be explained by the exercise nor by the effects on the blood-pressure and pulse-rate. The other 15 showed no specific electrical changes during the attacks.

B. Parsons-Smith,<sup>9</sup> in an article on the *prognosis of coronary thrombosis*, states some points of importance: (1) That heredity plays some part in the outlook, seeing that families have been described in which lesions of the coronary artery seem to be prevalent. (2) The severity of the attack in regard to pain does not correspond to the chances of the patient's recovery. (3) Amongst the characteristics upon which a favourable outlook may be based after the initial attack are prompt relief of pain under treatment, a steady recovery from the initial shock, improvement in the quality of the heart-sounds, progressive restoration of the stability of the pulse, a subsidence of the temperature, and the gradual disappearance of the leucocytosis. From a series of cases in his own practice he estimates that 50 to 60 per cent of all cases of coronary thrombosis are immediately fatal.

Recent reports include three cases of *rupture of the coronary artery into the pericardium* (C. T. Olcott,<sup>10</sup> C. B. Bamford<sup>11</sup>). Clinically they occur as cases of sudden or rapid death. All three cases were between 60 and 70. In one case, a man had a severe pain over both clavicles while at his office; when he was seen an hour afterwards the heart was regular, strong, and slow. There was sweating and pallor; regurgitant murmur at the aorta was heard which had not been present at an earlier examination. The picture was that of an attack of coronary thrombosis, and the duration of symptoms was fifteen hours. In another case a man in an asylum stayed in bed because he did not feel well, and the next morning was found dead after he had gone through the ordinary early morning routine of the hospital. The third patient died suddenly, having previously been found to have a weak irregular heart. In two of these cases the anterior descending branch of the left coronary artery was affected, and in the third the circumflex branch of the same artery. There were aneurysms at the site of rupture in two, and a patch of arterial degeneration in the third. The descriptions make it clear that the arterial change is degenerative and arteriosclerotic, akin to those in the brain which cause cerebral hemorrhage.

L. Langeron<sup>12</sup> relates three cases of *severe cardiac pain* treated by the method of Lemaire of injecting **Stovaine** into the peripheral skin area where it is hypersensitive. The cases are all probably of the nature of coronary thrombosis. In two of these the pain, which had resisted treatment by other remedies, including morphia, was relieved, whereas in the third case there was no relief. The injection is made in the cutaneous area which is hypersensitive; 10 c.c. of 1 per cent stovaine in water is injected subcutaneously.

REFERENCES.—<sup>1</sup>*Jour. Amer. Med. Assoc.* 1930, June 14, 1945; <sup>2</sup>*Med. Jour. and Record*, 1931, Feb. 4, 132; <sup>3</sup>*Arch. of Internal Med.* 1931, Jan., 1; <sup>4</sup>*New Eng. Jour. Med.* 1930, Oct. 9, 709; <sup>5</sup>*Ann. of Surg.* 1930, Dec., 1014; <sup>6</sup>*Amer. Jour. Med. Sci.* 1931, Jan., 35; <sup>7</sup>*Lancet*, 1931, i, 15; <sup>8</sup>*Arch. of Internal Med.* 1931, March, 339; <sup>9</sup>*Practitioner*, 1930, Sept., 353; <sup>10</sup>*New Eng. Jour. Med.* 1931, April 9, 760; <sup>11</sup>*Brit. Med. Jour.* 1931, i, 842; <sup>12</sup>*Presse méd.* 1931, April 11, 521.

### ANKYLOSIS OF JOINTS. (See JOINT ANKYLOSIS.)

### ANKYLOSTOMIASIS. (See also WORMS, INTESTINAL.)

*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

The seasonal incidence of hookworm infections in Assam and Bengal has been investigated by P. A. Maplestone<sup>1</sup> working in Calcutta, and he points out that this factor must be known before the degree of infection of any population can be deduced from the isolated examination of a sample of the people. Chandler applied corrections to his figures for various parts of India on the assumption that maximum infection is in November and minimum in April and May, but Maplestone finds the reverse to be the case in parts of Assam and Bengal. Further, intensive night-soil conservancy for two and a half months during March to May would probably reduce hookworm infection to a negligible degree in the places investigated, and the proper selection of coolie lines might exert a favourable influence. L. Schapiro<sup>2</sup> reports on hookworm incidence in Panama in a group of Guadine Indians compared with that of a mixed and white population; the former live away from the coast and defecate only in running water for religious reasons, while their poor diet predisposes to non-helminthic anemia. Both races showed lower female infection-rates, but the Indians, who do not pollute the soil, showed average hookworm egg counts of less than one-third of those of the non-Indians. An efficiently supervised pail system of sewage disposal is recommended by M. Khalil<sup>3</sup> in Egypt for the control of hookworm and other helminthic infections. He has also confirmed the observation of Chandler that hookworm infections disappear from prisoners under good sanitary conditions by preventing reinfections.

TREATMENT.—**Tetrachlorethylene** is recommended as being practically non-toxic and efficient in hookworm infections by E. A. Sharp.<sup>4</sup>

REFERENCES.—<sup>1</sup>*Ind. Jour. Med. Research*, 1930, Oct., 685; <sup>2</sup>*Amer. Jour. Trop. Med.* 1930, Sept., 365; <sup>3</sup>*Ann. Trop. Med. and Parasitol.* 1931, March 31, 35; <sup>4</sup>*Jour. Trop. Med. and Hyg.* 1930, Nov. 15, 336.

### ANOREXIA NERVOSA. (See PSYCHONEUROSSES.)

### ANTHRACOSIS. (See PNEUMONOCOINOSSES.)

### ANTISEPTICS IN MIDWIFERY. (See LABOUR AND ITS COMPLICATIONS.)

### ANUS, FISSURE OF.

*J. P. Lockhart-Mummery, F.R.C.S.*

Theodor Meisel<sup>1</sup> recommends as a palliative treatment for anal fissure the application of a combination of papaverin, extract of belladonna, anæsthesin, and scarlet red, which has been named '**Fissanal**'. It is applied by means

of a small glass rod, and he claims that it brings relief and helps to heal the fissure. It should be applied at first by the medical attendant, but afterwards the patient can be instructed how to put it on himself.

W. B. Gabriel<sup>2</sup> describes a new solution for producing anaesthesia in cases of anal fissure, which consists of **Percaine** 5 per cent, **Benzyl Alcohol** 10 per cent, **Phenol** 1 per cent, in 5 c.c. of **Sterilized Oil**. He thinks this produces a more rapid effect than the previously used A.B.A. solution. He found favourable results in the treatment of fissure where the fissure was comparatively small or recent, but does not consider it satisfactory in cases accompanied by piles or where there is a large indurated fissure, for which operation is the most satisfactory treatment.

A very good local application for the treatment of painful fissure is an 8 per cent solution of **Cocaine Hydrochloride in Castor Oil**. The patient should be instructed to strain down and apply a drop or two of the oil with the tip of his finger. The slight temporary stinging will be evidence that the oil has reached the right spot. The patient should also be instructed to have a hot bath after the bowels act, or bathe himself with very hot water, and then to lie down for a quarter of an hour. The stool should be kept as soft as possible to enable the fissure to heal. After the pain has begun to go off a stimulating ointment should be used, such as—

R	Ex. Hydrarg. Subchlor.	gr. ij		Ex. Belladonna	gr. ij
	Ex. Opii	gr. ij		Lanolin	3j

When the fissure is causing severe pain, or is not promptly relieved by local treatment, it is advisable to operate at once. The operation can be done quite easily under local anaesthesia, and the relief is immediate. It is, however, advisable for the patient to lie up until the small wound has healed.

REFERENCES.—<sup>1</sup>*Munch. med. Woch.* 1931, Jan. 16, 102; <sup>2</sup>*Brit. Med. Jour.* 1930, ii, 311.

## ANUS, FISTULA OF.

J. P. Lockhart-Mummery, F.R.C.S.

TREATMENT.—Ernest Miles<sup>1</sup> points out the importance of getting thorough drainage by widely laying open the fistulous tracks and establishing drainage of the whole area. He states that in many of the fistulae which appear to open very high up in the bowel the track lies just under the mucous membrane, and it is not necessary to divide the sphincters, as such tracks will heal up if laid open into the bowel. He stresses the importance of laying open all subsidiary tracks, as many of the cases of failure to cure a fistula are due to the fact that some lateral track has been missed.

REFERENCE.—<sup>1</sup>*Practitioner*, 1931, May, 501.

## APPENDICITIS.

A. Rendle Short, M.D., F.R.C.S.

BACTERIOLOGY.—It will be remembered that **Anti-gas-gangrene Serum** has been recommended for appendicitis-peritonitis. It is therefore of interest that according to J. E. Jennings,<sup>1</sup> *B. welchii* is found in the lumen of the appendix in 90 per cent of cases of appendicitis, and often outside. He considers that the use of the serum reduced the mortality in a series of patients with gangrenous appendicitis or spreading peritonitis from 35 per cent to 24 per cent. On the other hand, Mellenby<sup>2</sup> reports that in the peritoneal exudate *B. welchii* was only present in about one-fifth of the cases, and these were not more seriously ill than the rest.

THE REPROACH OF THE PRESENT MORTALITY.—J. O. Bower<sup>3</sup> publishes an investigation of the results in twenty-seven hospitals in Philadelphia, and finds that 1 patient in 18 (5.97 per cent) treated for acute appendicitis dies, and 44.7 per cent have peritonitis before they are admitted.

Of 5121 cases of acute appendicitis (all cases)	6.0	per cent	died.
Of 1643 cases admitted within 24 hours of onset	2.5	"	"
Of 1648 " " 24-48 " "	6.3	"	"
Of 628 " " 48-72 " "	8.6	"	"
Of 896 " " after 72 " "	11.8	"	"

The two great causes of death are delay, and purgatives; out of 131 cases of fatal peritonitis, *all but seven had been given an aperient*. Posters have been exhibited round the town to this effect: "In the presence of abdominal pain give nothing by mouth. Never give a laxative. Apply an ice-bag to the abdomen. Call your family physician. Abdominal pain which persists for six hours is usually dangerous." Pharmacists have been warned not to sell an aperient to patients without asking if abdominal pain is present.

DIAGNOSIS.—W. S. Pugh<sup>4</sup> points out that acute seminal vesiculitis may mimic appendicitis very closely. It is generally due to gonorrhœa, and is quite common. The diagnosis can be made by feeling the tender vas deferens, and palpating the swollen vesicle on rectal examination.

[A short time ago the reviewer operated for an apparently quite typical attack of acute appendicitis, and found a normal appendix, but part of the cæcum gangrenous, from mesenteric thrombosis. It had to be resected. Such a case would have been a very unpleasant experience for the 'occasional surgeon'.—A. R. S.]

R. Soupault and G. Seillé<sup>5</sup> call attention to pelvic appendicitis. Cases of acute appendicitis with the appendix in the pelvis constitute about one-fifth of the total. They are very important, because so apt to mislead the medical attendant. There is neither pain, tenderness, nor rigidity in the right iliac fossa. If the appendix is low in the pelvis, there will probably be frequency and painful micturition, and there is tenderness on rectal examination. If it lies high in the pelvis, these signs fail, but lower abdominal pain of acute onset, with vomiting and fever, and some tenderness in the hypogastric region, are enough to warrant the diagnosis in boys, girls, and men. In women, acute salpingitis has to be considered. At a later stage, pelvic appendicitis gives rise to symptoms of intestinal obstruction, or a pelvic abscess may form.

TREATMENT OF ACUTE APPENDICITIS.—Atkinson Stoney<sup>6</sup> wipes the area from which a sloughed or perforated appendix has been removed with 'B.I.P.P.', also the edges of the wound; he considers it makes for cleaner healing. J. B. Deaver<sup>7</sup> has given up jejunostomy in cases of appendicitis followed by ileus; instead he uses the **Jutte Tube**, which is passed through the nose at the end of the operation and left in the stomach. It keeps the stomach empty, is well tolerated, prevents vomiting, and allows water to be introduced. It is kept clean by injecting warm saline solution every hour and aspirating it out again. The Jutte tube is also useful for stomach cases. It can be left in several days if the nares are kept well greased. Later, it is clamped for a few hours daily, and nourishment given through it when peristalsis is restored.

Thiéry<sup>8</sup> has reduced his mortality from 30 to 15 per cent in cases of diffuse peritonitis by pouring in 200 c.c. of **Ether**, in addition to providing drainage.

*The Incision.*—A. H. Southam<sup>9</sup> brings a heavy charge against the gridiron (McBurney) incision, that it is often followed by an inguinal hernia from injury to the ilio-inguinal nerve. He quotes Roberts as reporting that the City of London Truss Society meets twenty or thirty cases a year of hernia following this incision, and Griffiths as finding 10 examples in 100 consecutive cases of hernia, 9 after the McBurney and 1 after the Battle incision. A. J. Cokkinis<sup>10</sup> advocates a horizontal incision, directly inwards from the anterior superior iliac spine. It is not suitable unless the diagnosis is certain.

A. L. Soresi<sup>11</sup> opens the abdomen by a latero-posterior incision parallel to the axillary line, an inch behind the anterior superior spine. The muscle fibres are separated, not incised. It is specially suitable for the retrocaecal appendix. The advantage is that it is not likely to be followed by the formation of adhesions.

*Statistics.*—The French Société Nationale de Chirurgie had a discussion on the treatment of acute appendicitis in April, May, and June, 1931, in which a number of leading surgeons took part and presented their figures. The general method of treatment is to operate at once for acute appendicitis *à chaud* during the first two days, and for general peritonitis, but to delay intervention when an abscess is forming. Many figures were given: Lenormant<sup>12</sup> mentions 273 cases with 29 deaths (mortality 10.25 per cent). In Chevrier's<sup>13</sup> series, the death-rate after operation on the first day (79 cases) was 1.29 per cent; on the second day (47 cases) 10.6; third day (16) none died; fourth and following (19) 10.5 per cent. Faure<sup>14</sup> says that of 115 cases closed without drainage, only 2 died; of 44 drained, 20.4 per cent died.

E. W. Sheaf,<sup>15</sup> of Guildford, who uses Crile's anoci-association methods, had 394 cases, with 9 deaths (2.3 per cent).

L. W. Tasche and J. P. Spano,<sup>16</sup> of Minneapolis, report:—

	CASES		MORTALITY	
Acute suppurative cases .. ..	72	..	1.4	per cent
Localized peritonitis .. ..	156	..	2.5	„
Abscess formation .. ..	112	..	9.7	„
Diffuse peritonitis .. ..	21	..	38.0	„

The treatment was immediate operation in all cases.

A. Müllerder<sup>17</sup> gives the Vienna figures as follows:—

	CASES		MORTALITY	
Acute appendicitis, not perforated .. ..	229	..	0.3	per cent
Appendicitis gangrenosa .. ..	18	..	5.5	„
Perforated appendicitis .. ..	34	..	20.6	„
Total .. ..	687	..	1.3	„

It is not easy to draw conclusions from the statistics of operation for appendicitis. Some surgeons and hospitals are fortunate in getting a large proportion of early cases; others are not. Some figures include cases of 'acute appendicitis' in which the symptoms are only a day old but the temperature and pulse are not raised; others rule these out and include only febrile cases. In 1928, no fewer than 25,000 persons died of appendicitis in the United States.

**Chronic Appendicitis.**—P. J. Buchmann,<sup>18</sup> a Russian surgeon, maintains that there is a sign of this disease which held good in over 3000 patients—namely, a dilatation of the right pupil.

W. A. Bigelow<sup>19</sup> has investigated a long series of cases operated on for pain in the right iliac fossa in which, in addition to excising the appendix, the bands and membranes on the cæcum were carefully removed. Of 520 followed up, 93 per cent professed themselves cured.

J. Speese and F. A. Bothe<sup>20</sup> believe that a factor causing failure to relieve pain by removing the appendix in chronic cases is some degree of obstruction of the ileocaecal valve. They say that follow-ups after appendicectomy for chronic appendicitis show 20 per cent of failures. By testing the free patency of the ileocaecal valve, and removing adhesions if necessary, they have had better results. For the kind of obstruction they refer to, and the method of omental grafting after freeing, see *Plate IV*.

# PLATE IV

## ILEOCÆCAL OBSTRUCTION AFTER APPENDICECTOMY

(J. SPRESE AND F. A. ROTHE)

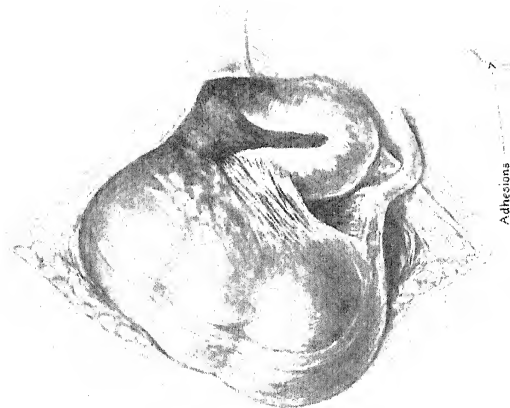


Fig. A.—Valvular type of obstruction showing adhesions.

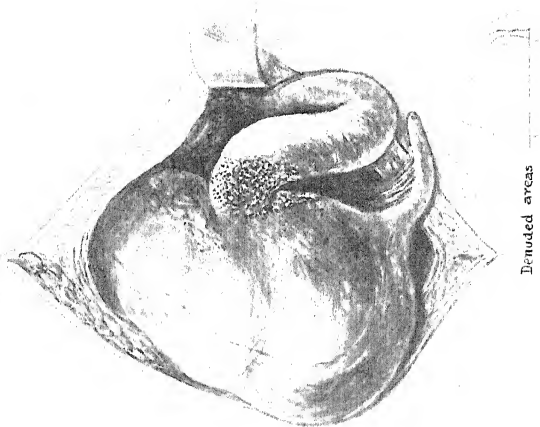


Fig. B.—Serosal defect produced by freeing of adhesions.

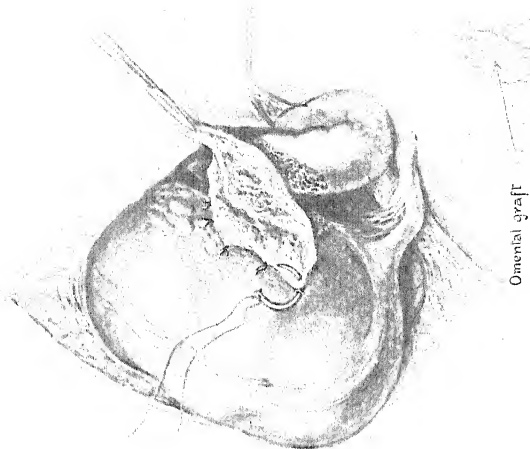


Fig. C.—Omental graft sutured over defect.  
*By kind permission of 'Annals of Surgery'.*





REFERENCES.—<sup>1</sup>*Ann. of Surg.* 1931, April, 828; <sup>2</sup>*Ibid.* 937; <sup>3</sup>*Jour. Amer. Med. Assoc.* 1931, May, 1461; <sup>4</sup>*Med. Jour. and Record*, 1930, Aug., 123; <sup>5</sup>*Rev. de Chir.* 1930, July, 177; <sup>6</sup>*Irish Jour. of Med. Sci.* 1930, Nov., 686; <sup>7</sup>*Surg. Gynecol. and Obst.* 1930, Oct., 521; <sup>8</sup>*Bull. et Mém. Soc. nat. de Chir.* 1931, June, 807; <sup>9</sup>*Brit. Med. Jour.* 1931, i, 258; <sup>10</sup>*Lancet*, 1930, ii, 1396; <sup>11</sup>*Amer. Jour. Surg.* 1931, March, 552; <sup>12</sup>*Bull. et Mém. Soc. nat. de Chir.* 1931, May, 760; <sup>13</sup>*Ibid.* June, 872; <sup>14</sup>*Ibid.* April, 543; <sup>15</sup>*Guy's Hosp. Rep.* 1931, April, 229; <sup>16</sup>*Ann. of Surg.* 1931, April, 899; <sup>17</sup>*Wien. klin. Woch.* 1930, Dec., 1501; <sup>18</sup>*Presse méd.* 1930, Aug., 1094; <sup>19</sup>*Canadian Med. Assoc. Jour.* 1930, July, 22; <sup>20</sup>*Ann. of Surg.* 1930, Oct., 728.

## ARRHYTHMIA AND ELECTROCARDIOGRAPHY.

A. G. Gibson, M.D., F.R.C.P.

**Sinus Arrhythmia.**—J. M. Faulkner<sup>1</sup> draws attention to a form of sinus arrhythmia seen in older patients, and he records case notes of four patients whose ages varied between 61 and 87. Unlike that found in children, it is not always a benign irregularity, and is more apt to be associated with organic heart disease, often being met with in patients with advanced and progressive cardiac disease. Of 22 patients with sinus arrhythmia over 52 years of age, he records that in the Boston City Hospital 16 had arteriosclerotic heart disease, 4 syphilitic, and 2 rheumatic. Sinus arrhythmia is not infrequently seen for periods on the reversion to sinus rhythm after auricular fibrillation, auricular flutter, or paroxysmal tachycardia. Digitalis does not appear to have produced any improvement. Some of the patients had been sent for examination with a supposed diagnosis of auricular fibrillation, which had been suggested by the irregularity.

**Tachycardia.**—W. E. Hume's<sup>2</sup> Bradshaw Lecture on *paroxysmal tachycardia* gives a very clear account of our present knowledge. He classifies the different varieties into the following: (1) Auricular, including (a) regular auricular tachycardia, (b) auricular flutter, and (c) paroxysmal auricular fibrillation; (2) Auriculo-ventricular (nodal), including superior nodal, inferior nodal, and nodal varieties; (3) Ventricular. Typical electrocardiograms are given of these varieties.

By far the commonest type according to published reports is *supra-ventricular tachycardia*, which constitutes 78.3 per cent. The attack is characterized by an abrupt onset and termination; prodromal symptoms are usually absent, but occasionally have been noticed, such as a feeling of well-being or an exceptional thirst. Exciting factors are also not very common, but are noted to include prolonged physical effort, walking after a heavy meal, bending down, holding the breath, or some emotional shock. The pulse-rate in short attacks is fairly constant, though in longer attacks there may be a variation. Evidence of cardiac disease is absent in about two-thirds of the cases in supra-ventricular tachycardia. The reverse, however, is true of ventricular tachycardia, in which four-fifths of the patients show cardiac disease. Prolongation of an attack of supra-ventricular tachycardia leads in the course of several days to dilatation of the left ventricle. Rarely pain of an anginal character may be experienced during the attack. Arterial pressure usually falls slightly. In some patients nervous symptoms occur, such as vertigo, temporary blindness, syncopal attacks, or even epileptiform seizures. No rule can be made as to the frequency or length of the attacks. Some patients have suffered from time to time through a long and busy life.

The diagnosis is not difficult if an electrocardiogram can be obtained, but so often this is impossible. The author makes the following suggestions for a clinical diagnosis: If the ventricular rhythm is very rapid and irregular, the condition is one of auricular fibrillation or auricular flutter. In the latter, however, there are frequent periods in which the ventricular rhythm is regular. If, on the other hand, the ventricular rhythm is very rapid and regular, it

may be a regular auricular flutter, a supra-ventricular tachycardia, or a ventricular tachycardia. Vagal pressure may assist in differentiation, and if the attack is arrested, the case is one of supra-ventricular tachycardia. If there is no arrest, then the case is one of supra-ventricular or ventricular tachycardia. It is more likely to be the former if the patient is under 40 years of age, has no cardiovascular disease, and has been subject to previous attacks. Ventricular tachycardia is frequently the accompaniment of signs of coronary thrombosis.

The treatment is not very satisfactory; sometimes a trick learnt by the patient may be efficacious, such as deep inspiration, the inducement of vomiting, or occasionally compression of the vagus. In ventricular tachycardia **Quinidine Sulphate** is recommended, with an initial dose of 5 gr., raising the amount every four hours.

**Auricular Fibrillation.**—J. Parkinson and M. Campbell<sup>3</sup> review the *paroxysmal* variety in a record of 200 patients. In 70 per cent structural heart disease was present, rheumatic, myocardial, or from hyperpiesis. Goitre accounted for 15 per cent, and in the remaining 15 per cent no etiological factor was ascertained. The patients are able to lead a normal life between the attacks. These are for the most part so slight as to give rise to no more than palpitation, breathlessness, and inability to continue work. Nausea, vomiting, abdominal pain, diarrhoea, and polyuria are described, as well as faintness, giddiness, and angular pains. In the more serious attacks patients may lose consciousness. In the slighter attacks the only symptoms may be a slight limitation of effort. Some of the patients have recurrent paroxysms. In others the paroxysms precede the onset of a permanent fibrillation. Other paroxysms may accompany congestive cardiac failure or coronary thrombosis or follow pneumonia. If the fibrillation lasts as long as a week, it may become permanent. This is more likely in rheumatic heart disease. **Quinidine** should be given if the paroxysm has lasted for more than two or three hours. If this fails, **Digitalis** should be given in large doses. Between the attacks quinidine is the best remedy in diminishing their number.

A. M. Fishberg<sup>4</sup> draws attention to a rare form of auricular fibrillation which occurred in three cases where *metastatic growths invaded the right auricle*. The first case was a tumour of the right main bronchus with a copious right-sided hæmorrhagic pleural effusion. The second was a similar growth which had invaded the posterior wall of the right auricle. In this case fibrillation was intermittent. In the third case the posterior and lateral walls of the right auricle were infiltrated by a sarcoma which also affected the neighbouring mediastinal glands. In this case auricular flutter appeared fifteen days before death.

**Bundle Branch Block.**—I. G. W. Hill<sup>5</sup> reviews the subject of bundle branch block, an ailment which is most commonly seen in the later periods of life. The author attempted to make the diagnosis by clinical means alone, but was invariably unsuccessful. The electrocardiogram is the only certain means available. In the published records nearly half the cases show advanced heart disease. In the author's series of 41 cases very few failed to show a pronounced degree of cardiac failure. The cardinal sign in those cases that have no cardiac failure is dyspnoea. The etiological factors included syphilis with aortic regurgitation (9.5 per cent), rheumatism, and toxic goitre, but the most frequent type is that associated with arteriosclerosis and hyperpiesis. The mortality is high, and the expectation of life in the author's cases is just over a year. Individual cases, especially those not belonging to the hospital class, may survive many years.

S. B. B. Campbell and S. I. Turkington<sup>6</sup> analyse 56 cases of right bundle

branch block, all of which were permanent. They mention that several authors have found isolated attacks from temporary branch block. Their list of symptoms agrees with that detailed above, and coincides with what is usually thought to be myocardial degeneration: 43 out of 56 cases complained of dyspnoea on exertion, effort pain was present in 22, myocardial insufficiency in 34. Cardiac enlargement was almost universal, and 10 had pronounced enlargement. Two cases had pericardial friction; triple rhythm was observed in 7 cases, auricular fibrillation in 4, and pulsus alternans in 1. An interesting feature of the series is that the outlook in hospital cases is not so good as in the others. There was a case-mortality of 73 per cent in the former and 42 per cent in the latter. Two of the cases have been alive for nine years since the diagnosis was made by the electrocardiograph, and one case is probably of thirteen years' duration.

REFERENCES.—<sup>1</sup>*Amer. Jour. Med. Sci.* 1930, July, 42; <sup>2</sup>*Lancet*, 1930, ii, 1055; <sup>3</sup>*Quart. Jour. Med.* 1930, Oct., 67; <sup>4</sup>*Amer. Jour. Med. Sci.* 1930, Nov., 629; <sup>5</sup>*Quart. Jour. Med.* 1930, 15; <sup>6</sup>*Ibid.* 1931, xxiv, 481.

### ARTERIES, DISEASES OF. (See also ANGINA PECTORIS AND CORONARY ARTERY DISEASE; ARTERIOSCLEROSIS, PULMONARY; BLOOD-PRESSURE.)

A. G. Gibson, M.D., F.R.C.P.

T. P. Noble<sup>1</sup> records a series of 15 cases of *thrombo-angiitis obliterans* from Siam. The most important of the early symptoms is intermittent claudication, and in 30 per cent a very early symptom is inflammation of the superficial veins. Two remarkable points about this series are: (1) The age of the patients, which varied between 26 and 37; and (2) That amputation was only once necessary below the knee, though toes and fingers had to be amputated. The author commends **Periarterial Sympathectomy** as a useful measure when simpler methods have failed.

J. M. Caudwell and J. G. Mayo<sup>2</sup> describe the application of the cutaneous reactions of *histamine* in the diagnosis of impaired circulation in the limbs such as Raynaud's disease and cases of vascular occlusion. The reaction as first described by Eppinger is as follows: A small area of skin is cleansed with alcohol and allowed to dry. A drop of 1-1000 solution of histamine acid phosphate is placed upon the area and introduced by pricking with a fine needle. The liquid is then wiped away. The characteristic reaction is (1) a reddish-purple spot, (2) a local wheal, and (3) a flare due to dilatation of the arterioles. Different portions of the skin in normal persons give a slightly different reaction. Compared with the normal, when occlusive vascular disease is present the reaction is delayed and reduced. This delayed reaction is seen in the spastic stage in Raynaud's disease and in scleroderma. The authors have observed that an improvement occurs in the reaction after resection of the sympathetic ganglia both in Raynaud's disease and in scleroderma.

From the point of view of the practitioner in charge of cases, W. M. Stevens<sup>3</sup> puts a very important question—namely: Can arterial disease be prevented, or if inevitable can its onset be delayed, and if present can its progress be arrested? From the anatomical point of view it is clear that the nodular arteriosclerosis is not an inevitable concomitant of advancing years and that the lesions frequently heal. This healing process is not so clear when sclerosis attacks the smaller vessels, nor is it clear in the generalized arterio-thickening that accompanies hyperpiesis. In this paper Stevens makes a plea for thorough and continued **Iodine Therapy** in all cases of arteriosclerosis. It is not possible to agree with his assumption that under these conditions iodine is of the nature of a vitamin factor, but his general advocacy of the use of iodine

appears to be justified by the results he publishes. A man aged 51, given 3 gr. of potassium iodide thrice daily every alternate fortnight, remained free from attacks of giddiness and shortness of breath on exertion, the results of hyperpiesis. A housewife, aged 64, with hyperpiesis remained for over two years of observation free from transient aphasic attacks, giddiness, mental depression, and sleeplessness. The author compares its value in these conditions to that in aneurysm.

H. E. Mehrrens and P. S. Pouppirt<sup>4</sup> have treated a number of cases of intermittent claudication by **Hyperpyrexia induced by Baths**. They find that it is a useful measure of treatment and that the milder cases improve better than the more severe, but they find no benefit in those cases in which gangrene has appeared. They immerse the patient in a bath at 110° F. The temperature may be begun at 105° and raised to 110°. An ordinary mouth thermometer is sufficient to register the lower temperatures of the patient, but a rectal thermocouple is better for the higher. When the temperature has been raised from 103° to 105° the temperature of the water is then raised to 110° F, and the whole bath allowed to continue for one hour. The patient is then taken out and wrapped in blankets to preserve the higher temperature for some time. The authors recommend a daily bath for fourteen days.

REFERENCES.—<sup>1</sup>*Lancet*, 1931, i, 288; <sup>2</sup>*Arch. of Internal Med.* 1931, March, 403; <sup>3</sup>*Clinical Jour.* 1930, Nov. 5, 529; <sup>4</sup>*Jour. Amer. Med. Assoc.* 1930, Dec. 20, 1910.

#### **ARTERIOSCLEROSIS, PULMONARY.** A. G. Gibson, M.D., F.R.C.P.

C. G. Paine and R. Platt<sup>1</sup> report three cases of pulmonary arteriosclerosis, and they point out that the syndrome of Ayerza's disease which has been restricted to pulmonary arterial disease of syphilitic origin may be seen also in cases in which there is no trace of syphilis. They conclude that the disease, whether syphilitic or otherwise, is preceded by a stage in which bronchitis is the main symptom. This may last for many years with a mucoid or mucopurulent sputum, and with occasional hæmoptysis. This is followed by the cardiac stage, which may be divided into the period of compensation with an enlarged hypertrophied right heart, a loud pulmonary second sound, and polycythæmia. The colour of the patients in this stage is reddish-purple. The final cardiac stage is that in which the patients become deep blue, violet, or almost black from the intense cyanosis, with generalized œdema, congestion of the lungs, hæmorrhages, somnolence, and sometimes anginal pain. Clubbing is not a constant feature. These authors note it in only one of their cases. Radiologically there is a widening of the pulmonary artery and an enlargement of the right auricle and ventricle.

Another series of cases with thrombosis is reported by O. Brenner.<sup>2</sup> This author makes the remark that cases in their very early stages are looked upon as chronic bronchitis with emphysema.

REFERENCES.—<sup>1</sup>*Brit. Med. Jour.* 1931, i, 698; <sup>2</sup>*Lancet*, 1931, i, 911.

#### **ARTHRITIS.** (See RHEUMATISM AND ARTHRITIS.)

#### **ARTHRITIS, ANKYLOSING.** (See JOINT ANKYLOSIS.)

#### **ASCARIASIS.** (See WORMS, INTESTINAL; X-RAY DIAGNOSIS.)

#### **ASCITES.**

A. Rendle Short, M.D., F.R.C.S.

F. Franke<sup>1</sup> passes in review some twenty methods of **Surgical Treatment** which have been recommended or carried out. He considers that clinicians have not given sufficient attention to the possibilities of relief afforded by operation. After the well-known Talma-Morison operation some weeks or

months elapse before any benefit appears. The method favoured by the writer when circumstances demand an easy operation and a quick result is **Ruotte's Saphenostomy**, which can be done under a local anæsthetic. The saphena vein is cut across, and the central end brought free into the abdomen. It is passed under Poupart's ligament. About fifteen successes have been recorded. Franke has had one success and one failure. The successful case had needed tapping every ten or twelve days, on twenty-two occasions, and 246 litres of fluid had been withdrawn. Two months after operation the patient was discharged cured. Amongst other available methods may be mentioned some form of Eck's fistula, and Rosenstein's operation, in which the fluid is led into the urinary bladder by making a valve out of the mucous membrane which allows water only to pass one way.

REFERENCE.—*Munch. med. Woch.* 1930, Nov., 2058.

**ASTHMA.** (See also ALLERGY IN CHILDREN; NOSE, DISEASES OF; THYMUS IN CHILDREN.) *W. H. Wynn, M.D., F.R.C.P.*

There is still some confusion in medical writings between asthma and bronchospasm, some authors using these terms as though they were synonymous. Bronchospasm may be produced in any person by various means such as the direct action of a local irritant, reflexly through the vagus by irritation of the nose or other parts of the body, by psychopathic states, and by endocrine disturbances: but such bronchospasm is not asthma. Bronchospasm is an important component of an asthmatic attack, but this comprises also various secretory and vasomotor phenomena and eosinophilia. The asthmatic syndrome can only occur in persons who have a special 'asthmatic' constitution, usually inherited and revealing itself by various allergic manifestations.

Biochemical investigations seem to show that there are slight differences from the normal in the chemical make-up of the asthmatic, but it is not yet clear how far such differences are fundamental and not merely the results of allergic attacks. Evidence is accumulating that there is an intimate connection between the state of allergy and the acid-base ratio of the body. H. Beckman<sup>1</sup> maintains that the tendency of the allergic person is towards alkalosis—that is, an increased alkali reserve—and that the more acidotic he is rendered the less allergic he becomes. In support of this hypothesis the author advances the following presumptive evidence. Asthma and diabetes are rarely associated. Joslin found only 6 cases of asthma among more than 6000 diabetics, and Walker saw only 2 cases of diabetes among 3000 asthmatics. Starvation causes acidosis and a disappearance of allergic diseases. Allergic phenomena improve during pregnancy, which is associated with the lowering of the alkali reserve. Acute febrile infections show the same tendency. The disappearance of asthma during a sea voyage and also at high altitudes is attributed to a diminution of the alkali reserve under these conditions. **Aspirin** causes a decrease in the alkali reserve and often relieves asthma. Beckman has long used the following formula for the treatment of hay fever—**Nitro-hydrochloric Acid** (not the dilute) 18 c.c., water to 120 c.c.; one teaspoonful in a glass of water followed by another glass of water, after meals and again as near midnight as possible: 237 cases treated by thirty-four physicians showed 67 per cent of successful results. He suggests that dilute hydrochloric acid, ammonium chloride, or acid sodium phosphate should also be tried along with a ketogenic diet.

R. J. S. McDowall and J. W. Thornton,<sup>2</sup> by their method of recording the movements of isolated bronchi, have shown that the bronchial muscle is sensitive to very slight changes in the hydrogen-ion concentration of the perfusing fluid, being dilated by acid and constricted by alkali within physiological

ranges. It is also affected by changes in the calcium-potassium balance, being constricted by a very slight increase in the calcium or a diminution of the potassium.

K. Tiefensee<sup>3</sup> tested the acidity of the urine in asthmatic patients to determine whether they inclined more to acidity or alkalinity. In untreated patients he found at the beginning and during the most severe stage of an attack the hydrogen-ion concentration was high, but the acidity and ammonia levels were low. During free intervals the conditions were reversed.

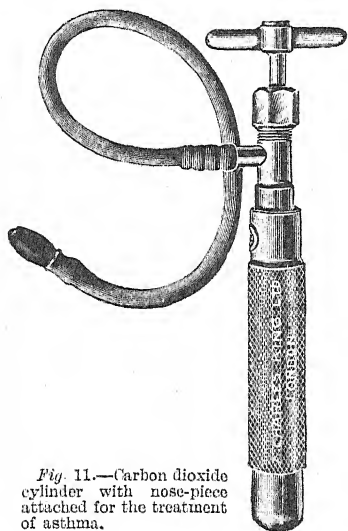
After finding that an attack of asthma could be checked when the acidity of the blood had been increased by the inhalation of air containing 5 to 8 per cent of **Carbon Dioxide**, he attempted to counteract the alkalosis by an acid diet. When the patients were placed upon an **Acid Diet** with the addition of salts inducing acidity, such as **Ammonium Chloride** or **Ammonium Phosphate**, the reaction became acid and the attacks of asthma milder or ceased entirely. When patients with asthma were placed in an allergen-free

chamber, the amount of acid excreted in the urine was increased, but complete improvement was only obtained when an acid diet was also given. In these cases the quantities of acid excreted in the urine were considerably larger than in patients who had not been in the allergen-free chamber. The author concludes that even if alkalosis is not the cause of asthma, it is nevertheless a significant symptom and can be counteracted by a diet inducing acidity.

M. M. Peshkin and A. H. Fineman<sup>4</sup> treated a number of children with severe asthma with **Ketogenic Diets** (low carbohydrate, high fat) and found marked improvement in the majority. Cases of pollen asthma and hay fever showed but little improvement, and children with asthma and recurrent eczema showed improvement from asthma but aggravation of the eczema.

A. F. Hurst<sup>5</sup> found benefit in his own case from a nasal douche of the gases

derived from Mont Dore water, consisting of over 99 per cent **Carbon Dioxide**, for five to fifteen minutes. He has adapted a small carbon-dioxide cylinder for home treatment. A rubber tube ending in a nose-piece is attached to the cylinder (*Fig. 11*). The nose-piece is inserted in a glass of water and the gas very slowly turned on until a moderately rapid stream of small bubbles is obtained. The nose-piece is then dried and inserted into one nostril. The patient should breathe through his mouth and the gas be allowed to flow into the nose without being actually inhaled. He advises that in cases of vasomotor rhinitis the treatment should be given for from five to ten minutes up each nostril every morning. In hay fever this should be done throughout the hay-fever season and in addition the gas should be used as often as necessary during the day immediately an attack threatens. For paroxysmal sneezing and nose-running it should also be given immediately an attack begins. In cases of asthma which begin with an attack of this kind the gas may prevent the attack from developing.



*Fig. 11.*—Carbon dioxide cylinder with nose-piece attached for the treatment of asthma.

J. F. Lang<sup>6</sup> reports on the favourable action of **Theocin Sodium Acetate** in asthma of long standing. The dosage recommended is 2 gr. at 6 p.m. and 10 p.m. the first night, dissolved in half an ounce of water. Thereafter one dose of 2 gr. is given nightly at 8 p.m.

REFERENCES.—<sup>1</sup>*Jour. Amer. Med. Assoc.* 1930, Nov. 22, 1552; <sup>2</sup>*Jour. of Physiol.* 1930, xliv, 70; <sup>3</sup>*Deut. Arch. f. klin. Med.* 1929, clxv, 265; <sup>4</sup>*Amer. Jour. Dis. Child.* 1930, xxxix, 1240; <sup>5</sup>*Proc. Roy. Soc. Med.* 1931, Feb., 441; <sup>6</sup>*Clinical Excerpts*, 1931, Jan., 9.

#### AUTOTRANSFUSION.

Sir W. I. de C. Wheeler, F.R.C.S.I.

A. L. Brown and M. W. Debenham<sup>1</sup> recommend the reinfusion of extravasated blood in cases of hæmothorax. In one case from the left pleural cavity 360 c.c. of unclotted blood were aspirated and replaced by 800 c.c. of air. The aspirated blood was filtered, citrated, and autotransfused into the vein of the right arm. Improvement was immediate. No further hæmorrhage took place.

The writers believe that in this instance the autotransfusion constituted the favourable turning-point in a condition which otherwise must certainly have terminated fatally. The same procedure was adopted in two other cases, one a stab-wound of the chest and the other a gunshot injury of the chest. In the third case the authors state they realized that the blood of an infected hæmothorax clots spontaneously, and since this had not occurred, reinfusion was done without waiting for blood-culture reports. They also state that the material collected should be filtered through gauze before re-injection. It may be citrated, but this procedure is not considered either necessary or desirable. Direct experimentation has shown that the bloody fluid in hæmothorax does not contain fibrinogen, and it is in reality defibrinated blood.

REFERENCES.—<sup>1</sup>*Jour. Amer. Med. Assoc.* 1931, April 11, 1223.

#### BACILLARY DYSENTERY. (See DYSENTERY, BACILLARY.)

#### BACKACHE IN WOMEN.

Beckwith Whitehouse, M.S., F.R.C.S.

It is common experience that backache is perhaps the most prevalent ailment of which women in indifferent health complain. Indeed, it must be rare to find a multipara who at some time or other has not been troubled with this distressing symptom. Nevertheless the attention that has been paid to the pathology and treatment of backache, both by gynæcological and orthopædic surgeons, is on the whole quite incommensurate with the great amount of discomfort and ill health which it produces.

C. L. Kark<sup>1</sup> has recently drawn attention to the importance of attacking the problem from the orthopædic standpoint, and points out that although backache may be associated with local disorders of the female pelvic organs, it is not necessarily a symptom of such disorders, but rather of structural and postural changes in the back itself. That this is so is proved over and over again by failure of treatment of the local condition—e.g., replacement of a retroverted uterus, or repair of a lacerated cervix—to relieve the backache which first brought the patient under observation. The common ache experienced by so many women over the sacro-iliac joints or lumbosacral articulation is attributed by Kark to prolonged strain of the anterior and posterior common ligaments and of the supraspinous and intraspinous ligaments, reinforced by the sacro-spinalis muscle. When the latter is not sufficiently strong to carry out its proper functions, aching results in the lumbo-sacral region. Normally the curves and structures of the spine are so arranged that the trunk is supported with a minimum tax upon the ligaments and sacro-spinalis muscle. Any deviation from this naturally renders the mechanism less efficient. Such a condition occurs during pregnancy, when, with the enlarging tumour, changing

centre of gravity, and softening of the ligaments and fascial structures, an extra strain is imposed in order to maintain the erect posture. Further, where there is weakness and loss of tone of the back muscles such as is found during debilitating illnesses, in frail young women, during menstruation, and, we may add, in the obese, the strain that the lumbo-sacral spine is normally able to cope with becomes too great. The lumbar arch, traced from the promontory of the sacrum upwards, becomes flattened, the ligaments are strained, and backache results.

Kark compares the lumbar with the plantar arch, and draws an analogy between backache and the factors responsible for the aching in flat-foot. In the latter, pain is caused by strain on the ligamentous structures of the flattened and weakened arch, and this can usually be relieved by mechanical support aided by suitable exercises and massage to strengthen the muscles which normally serve as supports.

**TREATMENT.**—If the thesis is accepted that backache is primarily the result of loss of muscle tone and faulty posture, then the essential factor in treatment is the provision of adequate **Support** and **Rest**. Such support must relax the strained spinal ligaments and muscles, and naturally varies with the patient's body weight, the type of arch, and the attitude of the body. If too strong or too weak it will fail in its purpose. In the same way, rest in bed without adequate support is of little value, and, as the writer points out, is often harmful, since the vast majority of beds sag. The patient lies in fact in a hollow, with shoulders and feet above the level of the lumbar arch, which consequently becomes dorsiflexed.

Kark has devised an adjustable pneumatic support to meet the necessary requirements, which according to him has given "most gratifying results in practice". This is endorsed by Dr. James Young, who has used the apparatus and found it of value at the Royal Infirmary, Edinburgh. The device consists of a rubber bag large enough to cover the lumbar arch, to which is connected a piece of rubber tubing attached to a valve and bulb. The cushion is inflated to the required degree to maintain the back in a constant state of relaxation and freedom from strain. The apparatus is obtainable from Messrs. P. B. Cow & Co. Ltd., 46, Cheapside, London, E.C.2.

REFERENCE.—<sup>1</sup>*Brit. Med. Jour.* 1931, i, 348.

**BANTI'S DISEASE.** (*See ANEMIA, SPLENIC; SYPHILIS.*)

**BENDIEN TEST IN CANCER.** (*See CANCER: THE BENDIEN TEST.*)

### **BERI-BERI.**

*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

Beri-beri in the Guntur district of Madras has been investigated by V. Mahadevan and T. K. Raman,<sup>1</sup> where the infantile form is not seen. The maximum incidence in adults is during the rainy season from August to October, and the disease is most prevalent in the rice-growing areas. The usual symptoms were observed, and a **Diet** of milk, bread, and bananas is advocated, with the exclusion of rice, together with adrenalin injections and atropine in heart cases, and venesection for the relief of dyspnoea. All cases responded rapidly to the administration of vitamin B, although the authors do not think that milled rice deficient in vitamin B is the sole cause of beri-beri.

The cardiovascular symptoms of beri-beri in the *epidemic dropsy type* are dealt with by R. N. Chopra and U. P. Basu,<sup>2</sup> of the hospital of the Calcutta School of Tropical Medicine, with the help of orthodiagrams and electrocardiograms. The oedema of the legs is attributed to dilatation of the capillaries and small subcutaneous vessels, and the diarrhoea to a similar affection



of the intestinal vessels; waterlogging of the myocardium was also noted, and cardiac asthma was attributed to probable œdema of the lungs, which the writers consider to be due to stress on the left heart and back-pressure, for dilatation of the left heart was noted without any hypertrophy, but the systolic blood-pressure was increased. These conditions differ from the heart changes of typical beri-beri as described by Wenkebach. In treatment digitalis and calcium salts failed, and adrenalin and ephedrine gave but temporary relief, but **Tincture of Ephedra** made from the Indian species *E. vulgaris* was considered to be more effective. **Venesection** was used for œdema of the lungs, and no cases were lost. An isolated family outbreak of epidemic dropsy in Eastern Bengal is attributed by S. L. Sarkar<sup>3</sup> to infected rice brought from a neighbouring district. The morbid anatomy of epidemic dropsy in Bengal is dealt with by G. Shanks, who has demonstrated a strong dilatation of the capillaries of the subcutaneous fatty tissues, the endometrium and cervix uteri, the ovaries, and in the small intestine—just where the vessels are least well supported. Even hæmangiomata may occur as nodules in the skin, which may rupture and bleed profusely.

REFERENCES.—<sup>1</sup>*Ind. Med. Gaz.* 1930, Oct., 555; <sup>2</sup>*Ibid.* 546; <sup>3</sup>*Ibid.* 1931, March, 121.

### **BILHARZIASIS.** (See SCHISTOSOMIASIS.)

### **BIOPSY BY NEEDLE PUNCTURE AND ASPIRATION.**

*Sir W. I. de C. Wheeler, F.R.C.S.I.*

H. E. Martin and E. B. Ellis<sup>1</sup> allude to the results obtained by securing tissue from suspected neoplasms for histological examination by needle puncture and aspiration. These writers have several times successfully obtained diagnostic material from masses within the lung with an 18-gauge needle attached to a Record syringe. The only apparatus other than the needle and syringe necessary for the procedure are glass slides and a specimen bottle with 10 per cent formalin. When the point of the needle is felt to enter the tumour, the piston of the syringe is partly withdrawn so as to produce a vacuum and the needle slowly advanced to an extent depending upon the anatomy and size of the tumour. Maintaining the vacuum, the needle is then withdrawn to the same distance and advanced again. This manipulation may be repeated two or three times at the discretion of the operator, care being taken to maintain the vacuum when the needle is advanced or partly withdrawn. Aspiration with the needle at rest is not sufficient to draw tissue into the needle in most cases. By advancing the needle and aspirating simultaneously, a plug of tissue is both forced and drawn into the needle. Maintaining suction during partial withdrawal detaches the plug of tissue already within the needle. This detail is very essential. Finally, the syringe is detached and the needle withdrawn separately. While the needle is being advanced and withdrawn under negative pressure, a small quantity of blood mixed with fragments of tissue may enter the syringe, or a solid cylindrical mass of tissue may appear. In other cases the syringe remains empty, but the needle is usually found to contain a plug of tissue. The contents of the needle are carefully expelled from the syringe on to a glass slide. A small fragment of tissue should be left on the slide for smearing, and the remainder placed in the specimen bottle for fixation and staining by regular methods. If the needle is empty, small masses of tissue can almost always be found mixed with blood in the syringe. If the syringe contains blood or any tissue, formalin from the specimen bottle is poured into the open barrel of the syringe, agitated, and returned to the specimen bottle.

The writers of this paper deal with the subsequent staining and recognition of the different tissues, but these are matters for the skilled pathologist.

They practically always secure tissue by the method described, and have been able to distinguish between malignant and benign conditions in all instances. Sixty-five cases are mentioned to illustrate the method.

REFERENCE.—*Ann. of Surg.* 1930, Aug., 169.

### BLADDER, ECTOPIA AND EXTROVERSION OF.

*John Fraser, Ch.M., F.R.C.S.Ed.*

W. Walters<sup>1</sup> discusses the treatment of extroversion in the light of his experience at the Mayo Clinic. In common with British and other observers, he finds that transplantation of the ureters into the sigmoid colon is followed by excellent results. The two-stage transplantation, first carried out by C. H. Mayo, is better than 'bilateral simultaneous transplantation'; the right ureter is dealt with in the first instance, and after ten days to a fortnight the procedure is repeated on the left side, in each case the tube being carried between the mucosal and muscular layers of the bowel for a short distance before it actually enters the lumen. The author found that most patients can hold the urine in the rectum for from four to six hours during the day, and frequently remain continent throughout the night. Ascending infection of the kidneys, if one is to judge from clinical evidence, is at the worst only slight. Walters states that it is important that the patient be at least four years of age; for this he gives no explanation, and there appears to be no strong reason why the operation should not be performed earlier—about the end of the second year, before the child has begun to mix to any extent with other children, and before any gross degree of renal infection has had time to become established.

REFERENCE.—*Ann. of Surg.* 1931, April, 862.

### BLADDER, SURGERY OF.

*Sir John Thomson-Walker, F.R.C.S.*

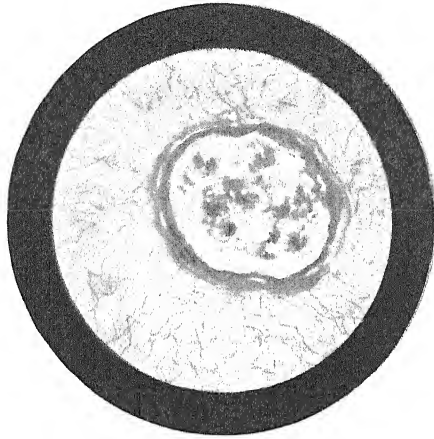
In the literature of the year growths of the bladder have received considerable attention. The variations in histological structure, the relation between this and the results of treatment, and the value of the different methods of treatment are all fully discussed. Thorough cystoscopic fulguration of simple growths, however extensive, is regarded as giving better results than open operation (Joly). The earlier adoption of total cystectomy in malignant growths is once more advocated (Wade). The results of treatment by radon appear to be disappointing (Kidd). The treatment of fibrous obstruction at the vesical outlet is the subject of some careful work (Collings). Diverticulum of the bladder is discussed without producing anything new.

**Growths of the Bladder.**—C. C. Higgins<sup>1</sup> describes a case of pedunculated fibro-myxoma of the bladder in a man of 29, suffering from hæmaturia. The growth was yellowish-grey in colour, weighed 30 grm., and measured  $5\frac{1}{2}$  by 4 by  $3\frac{1}{2}$  cm. Benign non-papillary tumours of the bladder are rare, and the writer reviews briefly the literature on the subject, classifying such tumours as follows: (1) Myoma: (a) fibromyoma, (b) leiomyoma, (c) rhabdomyoma. (2) Fibroma: (a) hard, (b) soft. (3) Angioma. (4) Myxoma. In most of the cases of simple non-papillary tumour of the bladder reported, the tumour had arisen in the region of the ureteral orifice or the trigone, although no part of the bladder is exempt. They differ from papillary tumours in that the main blood-vessels run between the mucous membrane of the bladder and the tumour, and thus do not pass directly into the body of the tumour. They usually reach a large size before producing symptoms, but if they have a long pedicle or if they are near the internal urinary meatus, obstructive symptoms may arise, or the tumour may be so placed as to cause ureteral obstruction with subsequent hydronephrosis.

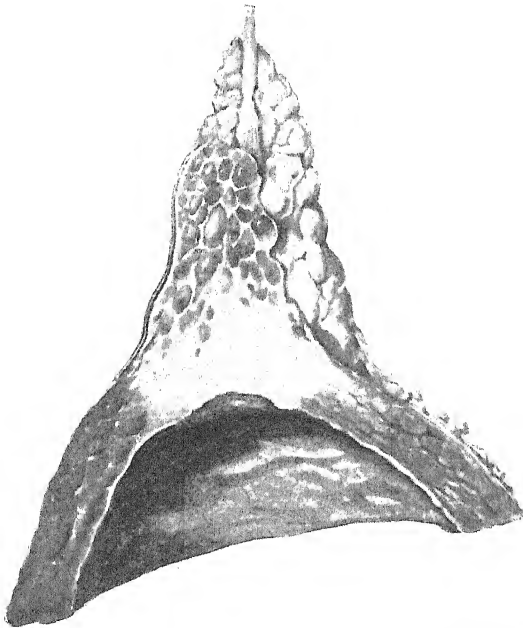
## PLATE V

### TUMOUR OF THE URACHUS

(R. CAMPBELL BEGG)



*Fig. A.*—A cystoscopic view of the tumour.



*Fig. B.*—Semidiagrammatic view of the specimen removed, showing the ulceration of the mucosa of the bladder and the relation of the urachus to the tumour. The peritoneum and prevesical fat can be seen.

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Campbell Begg<sup>2</sup> holds that there is definite evidence that colloid adenocarcinomata resembling rectal growths may arise in the muscular wall of the upper part of the bladder, and that the general tendency is for neoplasms in this region to assume the form of colloid cancer. Primitive cells of the urachus are always present in the muscular wall at the apex of the bladder. While these are totipotent, their bias is to form tumours of the intestinal type. Such neoplasms have, however, certain distinguishing features of their own. Adenomatous and cystic formations of various kinds are commonly found in connection with the lower end of the urachus (*Plate V*), and the connection between these and the colloid cancers can be followed through all the stages. All tumours of the bladder apex must be assumed to be of urachal origin from the point of view of treatment unless the contrary is proved, and this treatment should be by radical operation, removing the umbilicus and all the tissues between it and the bladder, as well as a large portion of the latter.

A. Boeckel<sup>3</sup> reports 14 cases of carcinoma of the bladder treated by **Electro-coagulation** through a suprapubic incision. In the majority of these the disease was so advanced that total cystectomy would, in the opinion of the writer, have been justified, with its immediate mortality of 52 per cent, and a mortality for the first year, in those surviving, of 30 per cent. The immediate results following electro-coagulation were very satisfactory. Although 3 died within eighteen months, and 1 cannot be traced, 8 have remained well and have been subjected to regular cystoscopic supervision during a period of from one to three years after treatment; 2 of the patients have been treated too recently to warrant any conclusion as to the end-results.

H. L. Kretschmer<sup>4</sup> reports his results in the treatment of carcinoma of the bladder by **Surgical Diathermy** carried out in 109 unselected cases. In all cases surgical diathermy was the only therapeutic agent used. In 70 the condition was far advanced and the results as regards cure were highly unsatisfactory, and the mortality-rate was high. In 23 cases seen relatively early with little involvement of the bladder wall the writer considers that the results were distinctly good.

G. G. Smith<sup>5</sup> analyses 50 cases of carcinoma of the bladder, of which 11 were treated by excision, 15 by electro-coagulation, and 24 by irradiation. He finds that cases of vesical carcinoma fall into two groups—the 'deeply infiltrating', and the 'superficial papillary'. He considers that the former, if strictly localized, may be excised or destroyed with **Radium** with approximately a 25 per cent chance of cure. If such a growth is situated on the trigone or in the neighbourhood of a ureter, the chances of successful cure are much less than if it is situated in the dome or lateral wall of the bladder. For such growths diathermy is not suitable. Cases of 'superficial papillary' tumours are best treated by electro-coagulation, and if there is induration about the base, the author irradiates by implanting one or two gold or platinum seeds. Such cases should be watched with the cystoscope for recurrences at least every three months during the first year, and at least every six months for the next five years.

J. S. Joly<sup>6</sup> reminds us that it is now twenty years since Beer introduced **Cystoscopic Diathermy** or 'fulguration', as a method of treating benign villous growths of the bladder, and he records his experience of, and views in regard to, this treatment. A villous growth most commonly first appears a short distance above and to the outer side of a ureteric orifice, and if left untreated increases in size and tends either to become malignant or to give rise to secondary benign tumours. Malignancy, Joly believes, only arises in growths that have remained single, while multiple tumours do not invade and infiltrate

the bladder wall. But ineffectual treatment may stimulate multiple growths to become malignant.

Vesical papillomata fall into two groups according to histological appearances. In the first group the epithelium of the villi consists of three or four layers of cells placed at right angles to the stem, the cells being regular in size, shape, and staining reactions. In the second group the epithelium consists of as many as twelve to fifteen layers. These cells and their nuclei are irregular in size, shape, arrangement, and staining power, and frequently show mitotic figures. The tumours in this second group are not strictly malignant in that they are not necessarily invading the underlying tissues, but they form a connecting link between the first group and the true epitheliomata, and their removal is apt to be followed by a true malignant recurrence, whereas recurrence after removal of growths of the first group is benign. As long as the growths do not infiltrate the bladder wall one can afford to ignore the nature of the epithelium and destroy them by diathermy. In order to compare the results of operation with his subsequent experiences with diathermy, Joly reports 39 cases of vesical papilloma operated upon before 1913, when he first commenced diathermy. In 30 the growth was single and in 9 multiple. There were recurrences after operation on the single growths. Two occurred within a year, and of these 1 had a second excision and is perfectly well twenty years after his first operation, and the second was treated by cystoscopic diathermy and has remained well. Of the other two recurrences, one was destroyed by diathermy six years after operation, and the second, thought to be malignant on clinical grounds, was treated by partial cystectomy, but on microscopic examination the recurrence appeared to be benign. Subsequently, thirteen years after the second operation, the patient was found to have an enormous infiltrating growth which led to death a few months after he was again seen.

In the cases of multiple growth the results of operation were deplorable, and all died owing to rapid recurrences within five years of the date of operation. From this series Joly points out that: (1) No form of excision, however careful the technique, can offer complete immunity from recurrence. (2) Excision offers practically no hope of a cure in cases of multiple growths. (3) A considerable proportion of all recurrences are malignant. He then considers the results of cystoscopic diathermy, discussing these under three headings:—

1. *Single growths*, of which he has been able to follow 26 cases for five years after cessation of all treatment. Recurrence occurred in 6, and of these only one recurrence was malignant. Two were discovered within a year, two about three years, and one fourteen years after treatment. The sixth was seen as a small pedunculated recurrence easily destroyed. The patient did not report in six months as requested, but returned two and a half years later, when a large ulcerating carcinoma was found at the site of the original growth. These cases, therefore, are satisfactory in that 25 out of 26 are apparently cured, although 5 have had to submit to two courses of treatment.

2. *Multiple growths*, of which 28 cases are reported. Here it was possible to clear the bladder of growth by cystoscopic diathermy, but in every case small recurrences were found from six to twelve months after treatment. By persisting in treatment, freedom from further trouble after observation lasting about three or four years was obtained. There were 2 failures, however, in this series, both in patients who absented themselves from observation for considerable periods, and in each carcinoma subsequently developed. The author states that he has never seen any sign of malignant degeneration in cases in which cystoscopic diathermy has been carried out completely and without interruption. The results of this group compare most favourably

with the uniformly disappointing results obtained by open operation for the same type of case. There are still cases of this kind in which open operation is called for, such as those associated with clot distension of the bladder or for profuse hæmorrhage. In such, Joly destroys the growth by diathermy through the suprapubic wound.

3. *Recurrences after open operation*, which may be multiple or single. There is difficulty in reaching the growths at or near the suprapubic scar, and to overcome this the author has devised a special electrode carrier for use with his cystoscope. Multiple recurrences after open operation, however, constitute the most difficult class of case, as there is an inveterate tendency to recurrence and the recurrence is often malignant. It is, however, possible to keep the patients free from symptoms and the growths under control by constant supervision in a proportion of such cases. Joly is emphatic that the end-results obtained by cystoscopic diathermy are much more satisfactory than those following excision. The objection to it is that it requires great skill and much time on the part of the surgeon, and considerable patience and fortitude on the part of the patient.

In a presidential address to the Section of Urology of the Royal Society of Medicine, London, S. G. MacDonald<sup>7</sup> discussed his results in partial resection of the bladder for carcinoma. Satisfactory classification of bladder growths as determined by cystoscopy is difficult, but he divides them into three groups: (1) Those probably benign; (2) Those certainly malignant; and (3) Those of doubtful nature. The first group are composed mainly of the single pedunculated papillomata seen in patients under 40 years of age. In the second group he includes: (a) 'bald' growths, (b) epitheliomatous ulcers having a thickened everted edge and necrotic base, and (c) infiltrating and nodular growths. In the third group, comprising growths of doubtful nature, are found most of the papillomata occurring after the age of 40, and the correct treatment of these is one of the most difficult problems in urology. They tend to be sessile with short and stunted villi, and there may be ulceration or necrosis, incrustation of the surface, puckering or œdema of the mucosa around the base, or the presence of outlying nodules beyond the main growth. When a stage of general papillomatosis is reached the author considers that the condition must certainly be regarded as malignant. Based on the above classification he reports 120 cases as being 'certainly malignant', 35 of which were operable and 85 inoperable. Of 'growths of doubtful nature' 55 are reported, 20 of which proved on subsequent microscopic examination to be malignant, and 35 benign. There are thus 140 cases of carcinoma of the bladder, 55 operable and 85 inoperable. For purposes of statistics the writer discusses the cases seen over a period of eleven years ending in 1927, during which time 44 cases were actually operated upon. Their ages varied from 31 to 74 years, the average age being 57 years; 34 were males and 10 were females; 6 died shortly after operation. During the next three years 15 died, all of recurrent growth except 2, the one of heart disease and the other of pyelonephritis. Nine cannot be traced, and thus 14 are known to be alive and well at the end of three years. The writer fears, however, that even this is an optimistic figure, as the three-year standard is much too short, for 2 of these 14 cases subsequently developed local recurrence, one seven years and another nine years after operation. A notable point in this series is the large number of cases which were inoperable when first seen—85 out of 140 (60·7 per cent).

V. C. Hunt<sup>8</sup> considers the various surgical procedures employed in the treatment of malignant disease of the urinary bladder which fail to respond to, or are unsuitable for, trans-urethral treatment. Of the malignant tumours

of the bladder seen at the Mayo Clinic, 95 per cent are epitheliomata, and Broders' index of the degree of malignancy is important in determining the type of treatment required. Malignant lesions of the bladder are found to tend toward the higher degrees of malignancy. In a series of 480 graded epitheliomata irrespective of their situation in the bladder, 58 per cent were of a malignancy graded 3 or 4. There is a greater tendency for the development of highly malignant epitheliomata in the base than in the lateral walls and dome. Thus, in 150 epitheliomata of the base the incidence of malignancy of Grade 3 or 4 was slightly more than 64 per cent as opposed to an incidence of slightly more than 53 per cent of 214 epitheliomata of the lateral and posterior walls and dome. It is justifiable to attempt more in the case of lesions of a lower grade of malignancy than for those of a higher grade. Most tumours of the dome and of the lateral or posterior walls are operable, and this is in great part due to their situation. In 370 cases of graded epithelioma in which radical operations were performed, the writer found that, irrespective of the size or situation of the lesion or the magnitude of the operation, 65 per cent of the patients who had lesions graded 1 or 2, and only 34 per cent in whom the lesions were graded 3 or 4, lived three or more years without recurrence. On the other hand, when results were determined according to the site of the lesion, it was found that in the case of patients operated upon for growths situated in the lateral walls and dome nearly 50 per cent more survived the period of three years without recurrence than of those who had been operated upon for lesions of the base.

Arising out of a recent review of the surgical procedures employed from 1925-9, inclusive, in 256 cases of malignant lesion of the bladder seen at the Mayo Clinic, the writer concludes that a most conservative estimate places the inoperability or questionable operability at about 50 per cent. He discusses briefly the various surgical procedures employed in dealing with bladder growths, with special reference to total cystectomy following preliminary ureterostomy, and reports one case so treated with satisfactory results. In conclusion, the writer states that as regards total cystectomy with transplantation of the ureters into the sigmoid colon, ureteral dilatation, renal infection, and poor healing power are all factors to be reckoned with, but he is of the opinion that many of these difficulties will be minimized in the future by earlier operation.

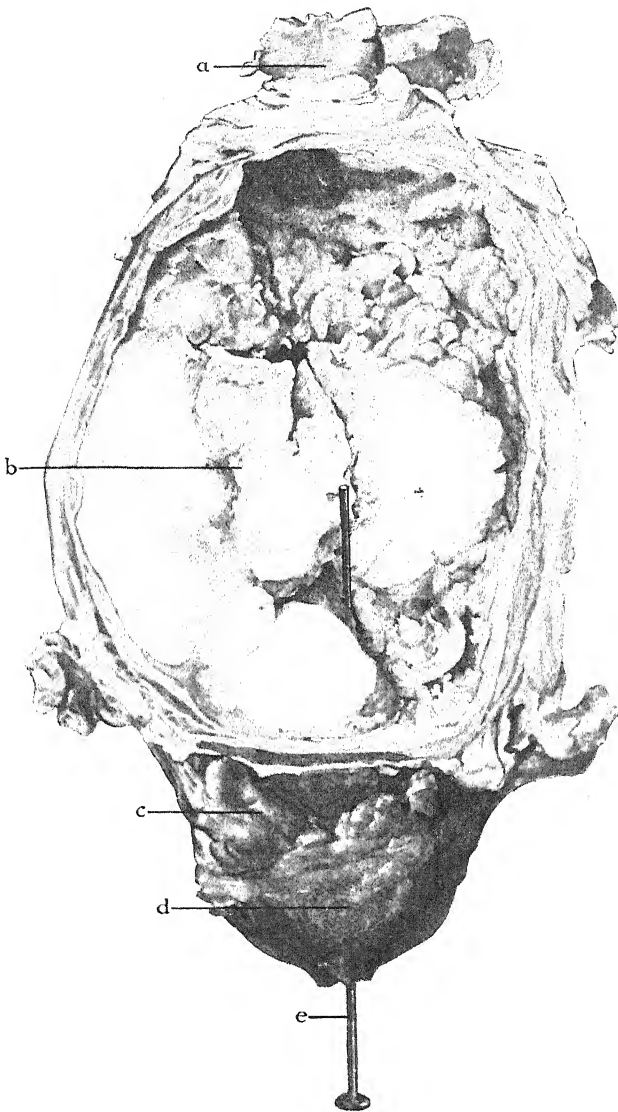
H. Wade,<sup>9</sup> in a paper on the treatment of malignant tumours of the urinary bladder, states that he has performed the operation of **Total Cystectomy** (*Plate VI*) on 8 patients. All recovered from the operation, and the comfort of the patients was greatly increased in that they were relieved from the misery of recurring vesical spasm, and natural sleep became possible. All lived for over a year and a half after the operation. Two operated on four and three years ago respectively are still alive; 3 have died of recurrence of the disease, and 2 of these seen shortly before death were found to have recurrence in the pelvis and their peaceful death appeared to justify the operation. Up to the present the operation has been carried out only in advanced cases as a desperate measure. The author is of opinion that if it is accepted that a complete cure of malignant disease of the urinary bladder cannot be effected by other means and that total cystectomy offers a prospect of effecting such a complete cure, the steps of the operation could be shortened, the disability attending the removal of the bladder very materially mitigated, and a treatment evolved which should reach a standard of perfection such as has been obtained in carcinoma of the rectum, where a cure can be effected at the price of a permanent inguinal colostomy. The patient's comfort after total cystectomy will be much greater if the urine is made to flow into the bowel



## PLATE VI

### CARCINOMA OF THE BLADDER

(IL. WADDE)



Total cystectomy and prostatectomy for carcinoma of the urinary bladder, showing bladder, prostate, and seminal vesicles removed in one piece. *a*, Healed scar of original exploratory abdominal incision; *b*, Carcinoma of urinary bladder; *c*, Seminal vesicles; *d*, Prostate; *e*, Glass rod in urethra.

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'Surgery, Gynecology and Obstetrics'*



rather than to the surface of the loin, but unfortunately his debilitated state may contra-indicate the former proceeding. In 6 of the writer's cases the ureters were transplanted on to the lateral aspect of the abdominal wall, which necessitates the subsequent use of a special apparatus for collecting the urine. In the 2 remaining cases the ureters were successfully transplanted into the bowel in two stages after Coffey's method.

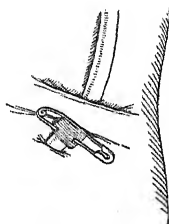
Th. Hryntsckak,<sup>10</sup> of Vienna, records two cases of total removal of the bladder for malignant growths, and discusses the subject. He concludes that total extirpation of the bladder (and prostate) for bladder carcinoma is from the present state of our experience justified if from the position or the extent of the growth partial resection of the bladder appears to be impossible. Deflection of the urine into the bowel is undoubtedly the best method, and is not necessarily followed by a high grade of infection or dilatation of the ureters. The right ureter should be implanted into the cæcum and the left into the sigmoid at different operations. The removal of the bladder by a combined suprapubic and perineal route is carried out at a subsequent operation. For ureterostomy on the skin surface he forms a skin-bridge just below the fistula and carries the rubber drainage tube beneath this so that no other method of fixation is required (*Fig. 12*).

F. Kidd<sup>11</sup> analyses the results obtained in 32 patients seen between 1922 and 1930 suffering from malignant tumours of the bladder which were treated with **Radon**.

**Diathermy** was employed in each instance as a preliminary measure. Bare glass seeds were used from 1922 until July, 1926, since when the glass seeds were screened with 0.3 mm. of platinum. All the tumours so treated were clinically malignant, though the majority were small. These cases were selected for this treatment for four reasons—because: (1) The patient refused extensive operation or would only consent to treatment by cystoscopic methods; (2) The tumours were in a position badly situated for partial cystectomy in that they lay between the ureter and the internal meatus; (3) In the case of pedunculated malignant tumours it was hoped that radon would shorten diathermy treatment and make it more secure; and (4) In the case of some of the sessile tumours it was hoped that cystotomy and radon implantation might prove less difficult and dangerous than partial cystectomy.

The writer describes his technique, and summarizes his results as follows: In 12 out of the 18 patients still alive, radon implantation following diathermy appeared to destroy a bladder tumour, but in only 4 of these cases was the growth at all extensive. In the remaining 6 cases the treatment was unsuccessful. In 11 of the 14 patients who have died, radon appeared to accelerate the progress of the disease, and in the other 3 it appeared to delay the final issue. As out of the 12 cases apparently cured by radon a cure might have been obtained in 8 had they been submitted to diathermy alone, or to excision alone, the writer is doubtful as to whether or not it is justifiable to employ radon seeds for the treatment of bladder growths save in exceptional cases where the growth is in a difficult position or when the patient refuses other treatment.

In 5 of the 32 cases analysed, the use of radon, instead of destroying, appeared actually to stimulate the growth. The writer concludes that: (1) Radon should not be employed in the treatment of simple papillomata, which are so susceptible to the action of diathermy; (2) As regards the treatment of pedunculated malignant papillomata radon may sometimes act as a stimulant rather than as a destroyer of cancer cells; (3) In cases of early infiltrating carcinoma



*Fig. 12.*—Skin bridge to hold ureterostomy tube in place.

confined to one side of the bladder, wide extra-peritoneal resection of the tumour, with, if necessary, section and re-implantation of one or even both ureters, is to be preferred to the use of radon; and finally (4) In dealing with extensive infiltrating carcinomata the implantation of radon may lead to extensive and painful sloughing, and he prefers, in suitable cases, total cystectomy with transplantation of ureters into the rectum, or, should the patient refuse to submit to this procedure, to implant these extensive growths with a medium dose of radon through the cystoscope, repeating this dose in three or four months, later still applying deep X-ray therapy, which he thinks is more effective if applied after treatment with moderate doses of radon.

B. S. Barringer<sup>12</sup> considers that epitheliomata with atypical cells should be regarded as malignant and treated accordingly, and if only the projecting portion of a tumour is removed for pathological examination the clinical estimate of the malignancy of the tumour should receive more consideration than the pathologic estimate. The writer found the results of radium implantation in 127 cases of malignant tumour of the bladder to be as follows: Of 45 cases of papillary carcinoma, 25 were kept under control for more than three years; and of 82 cases of infiltrating carcinoma, 23 were controlled for more than three years. He finds that, while the suprapubic implantation of radium has an operative mortality of between 3 per cent and 4 per cent only, that of operative removal has a mortality of between 10 per cent and 20 per cent.

O. S. Lowsley<sup>13</sup> describes an incision for operations upon the urinary bladder by means of an inverted V situated with its apex midway between the umbilicus and the upper margin of the symphysis pubis. He claims for this that the drainage tube can be placed high in the fundus of the bladder and brought out high in the abdomen, passing obliquely through the abdominal wall—a state of affairs making for rapid healing of suprapubic fistulae. He does not open the space of Retzius, and therefore considers the dangers of pelvic cellulitis to be eliminated. In a series of 45 cases in which this incision has been used, there have been 6 cases of infection of the suprapubic wound, which in all the others has healed by first intention, the average time required for the closing of the suprapubic fistula being 11.9 days.

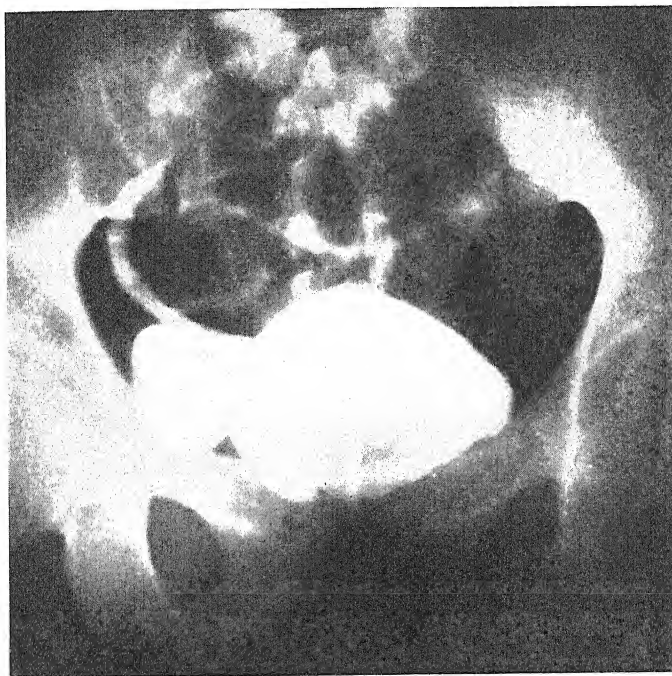
**Fibrous Obstruction of the Vesical Outlet.**—C. W. Collings<sup>14</sup> records his experiences in the treatment of a series of 25 patients, using his method of electric excision of the obstructing tissue through a modified cystourethroscope. He describes his technique and states that all the patients operated upon have now no residual urine, except three who have subsequently been found to have 10, 20, and 75 c.c. respectively. He limits the application of this form of treatment to cases in which he has diagnosed: (1) 'Fibrous prostatic bar'; (2) Obstructing scar formation following prostatectomy; and (3) Selected cases of 'bar formation' in cases of prostatic carcinoma. The operation is a relatively bloodless one and is carried out under constant vision. It has the great advantage that an elderly patient in poor health is saved a major operation associated with grave risk or serious complication, and the patient is confined to bed for a few days only. Collings states emphatically that benign enlargement of the prostate is best treated by prostatectomy, for out of 8 patients with this condition treated by means of electric excision 6 required a subsequent prostatectomy. The other 2 were elderly men suffering from diabetes and severe myocarditis, and they were treated for palliative purposes as their general condition was unsuitable for prostatectomy. They obtained some relief of symptoms as a result of the treatment. The proper selection of patients for this type of operation is all-important.

T. J. Kirwin<sup>15</sup> describes an instrument he has devised for the relief, by the trans-urethral route, of selected cases of obstruction at the vesical neck

## *PLATE VII*

### RADIOGRAPHY OF THE BLADDER

(T. BARNETT)



X-ray picture of bladder which has been filled with sodium iodide solution and then partially emptied. A diverticulum is seen on the right side overlying a dilated ureter.

*By kind permission of the  
'Newcastle Medical Journal'*



comprising so-called 'bar formation'. He claims that the advantages of his instrument, the details of the construction of which are well illustrated, are: (1) The elimination of the profuse hæmorrhage heretofore produced by instruments of this type. (2) The possibility of definitely regulating the amount of heat applied; he finds that slow desiccation of the blood-vessels eliminates sloughing which is apt to occur after the use of uncontrolled high temperatures without determining how deeply the tissues are being seared. (3) The fact that the circular knife removes the tissue to be resected by means of a lateral cut instead of an antero-posterior cut as in the case of instruments of the punch type. (4) Vision is never at any time obscured, as the vesical neck is continuously dilated by means of constant irrigation. (5) The lateral position of the knife makes possible the removal of a larger section of tissue. (6) The needle which transfixes the obstructing tissue permits of fixation of the part to be operated upon and enables it to be readily engaged. Slipping of the tissue under the knife has been one of the worst faults of instruments of this type, in that clean cutting was often difficult or altogether impossible. The writer briefly describes 6 cases treated by means of his instrument.

**Diverticula of the Bladder.**—W. E. Lower<sup>16</sup> analyses a series of 151 cases, of which 110 had been previously reported. Only 2 were found in women. He is of the opinion that a congenital predisposition exists to the formation of such diverticula, but that symptoms are produced and the diverticulum increased in size by obstruction. In the 2 females of the series a urethral caruncle was present in each, and in 48.4 per cent of the total series definite obstruction to the urinary outlet was present. As regards age incidence, 3 were found in the third decade of life, 7 in the fourth, 16 in the fifth, 28 in the sixth, 48 in the seventh, 38 in the eighth decade, and 2 were found in patients over 80 years of age. The age was not stated in 12 cases. Cystoscopic examination combined with cystography are essential for accurate diagnosis of the condition. Cystoscopy will reveal the orifice, but cystography is required in order to ascertain its size and to some extent its relationships. Not uncommonly complicating conditions such as cystitis, stone, or growth of the bladder are present, which may either mask the existence of a diverticulum or else lead to its discovery. Double micturition is very characteristic of the presence of a diverticulum. As regards treatment, complete excision is the only procedure which leads to permanently satisfactory results, and since obstruction in some form is nearly always an important factor in the development of diverticula the cause of such obstruction should be removed. If a radical operation is performed early, and before renal impairment has become marked, and any obstructing factor is adequately dealt with, the prognosis in cases otherwise uncomplicated is favourable. In the author's cases in which complete excision was performed the mortality was slightly over 5 per cent.

T. Barnett,<sup>17</sup> discussing the diagnosis and treatment of diverticulum of the bladder, emphasizes the value of cystography for the demonstration, not only of the presence of such a condition, but also of the approximate size and position of the diverticulum. He uses 10 per cent sodium iodide and takes three radiograms: (1) when the bladder is completely filled, (2) when it is partially emptied (*Plate VII*), and (3) after the bladder contents have been allowed to leave the bladder as completely as possible.

J. S. Eisenstaedt and T. G. McDougall<sup>18</sup> describe their technique for the removal of diverticula of the bladder, and emphasize the fact that non-surgical procedures are of little value and should be employed only when operative intervention is definitely contra-indicated by the poor general condition of the patient. Any treatment less radical than complete excision of the sac is unsatisfactory. Together with such complete excision must be considered the

removal of any source of obstruction such as urethral stricture or enlarged prostate, but the condition of the patient must decide whether this is to be done at the same time as the removal of the diverticulum.

**Calculus.**—J. R. Caulk<sup>19</sup> discusses the advantages and disadvantages of suprapubic removal of stone from the bladder compared with litholapaxy, and concludes that litholapaxy is the operation of choice, in that its performance is strikingly free from complications, and its mortality-rate is relatively insignificant. Further, as compared with open operation the results, as judged by the frequency of recurrence, appear to be superior, and finally the period of convalescence is much shortened. A series of 225 cases of vesical calculi is analysed in which there was associated prostatic enlargement in 116, in 20 of which the prostate was carcinomatous; 17 cases had stricture of the urethra, 7 of which were associated with prostatic hypertrophy. Other conditions found associated with stone were carcinoma of the bladder 13, diverticulum of the bladder 17, neurogenic bladder 5, suprapubic fistula 8, vesico-vaginal fistula 1, recto-urethral fistula 1, and perineal fistula 2. Obstruction was present in 55.8 per cent of all cases, and in the group associated with obstruction 70 per cent had given no previous history suggestive of stone formation, such as colic or the passage of calculi, and X rays of the renal areas were negative on admission. In 30 per cent of the cases of this group there was a previous history of renal colic or the passage of calculi. In the group not associated with obstruction 55 per cent gave a history of the previous passage of stones, or of attacks of colic, or had stones on admission.

In 112 of the 196 cases operated upon litholapaxy was performed, in 32 suprapubic lithotomy alone was done, and in 52 suprapubic lithotomy was performed in conjunction with prostatectomy or some other surgical procedure, such as diverticulectomy, partial cystectomy, radium implantation, or cauterization. Litholapaxy was performed in 44 cases in which there was associated prostatic hypertrophy, in 7 cases with prostatic carcinoma, and in 8 with stricture of the urethra. In 16 cases obstruction at the neck of the bladder was relieved after litholapaxy by means of the cautery punch. The writer believes that whenever possible open operation should be avoided in cases of carcinoma of the prostate. Thus litholapaxy, if necessary, in combination with radium implantation, or deep X-ray therapy, or trans-urethral operation with the cautery punch, affords better results than open operation in cases of carcinoma of the prostate associated with bladder stone.

REFERENCES.—<sup>1</sup>*Ann. of Surg.* 1931, April, 886; <sup>2</sup>*Brit. Jour. Surg.* 1931, Jan., 422; <sup>3</sup>*Bull. et Mém. Soc. de Chir.* 1930, July 4, 507; <sup>4</sup>*Jour. Amer. Med. Assoc.* 1930, Dec. 6, 1728; <sup>5</sup>*Ibid.* 1730; <sup>6</sup>*Proc. Roy. Soc. Med.* 1930, Sept., 1557; <sup>7</sup>*Ibid.* Nov., 69; <sup>8</sup>*Amer. Jour. Surg.* 1930, Oct., 69; <sup>9</sup>*Surg. Gynecol. and Obst.* 1931, Feb., 312; <sup>10</sup>*Arch. f. klin. Chir.* 1930, July, 554; <sup>11</sup>*Brit. Med. Jour.* 1930, ii, 949; <sup>12</sup>*Jour. Amer. Med. Assoc.* 1930, Dec. 6, 1734; <sup>13</sup>*Amer. Jour. Surg.* 1931, Feb., 305; <sup>14</sup>*New Eng. Jour. Med.* 1930, July 17, 107; <sup>15</sup>*Surg. Gynecol. and Obst.* 1931, May, 1007; <sup>16</sup>*Ibid.* Feb., 324; <sup>17</sup>*Newcastle Med. Jour.* 1931, Jan., 77; <sup>18</sup>*Jour. Amer. Med. Assoc.* 1931, March 14, 831; <sup>19</sup>*Ann. of Surg.* 1931, April, 891.

**BLEPHAROSPASM.** (See EYELIDS.)

**BLOOD-PRESSURE, HIGH.** (See also ARTERIES, DISEASES OF.)

A. G. Gibson, M.D., F.R.C.P.

J. S. F. Riseman and S. Weiss<sup>1</sup> make an analysis of the symptoms of uncomplicated hypertension upon over 1000 patients from the Boston City Hospital. They classify the symptomatology according to whether it is cerebral, cardiac, renal, or belonging to another vascular area. By far the commonest complaints are cerebral: headache, dizziness, and aches and pains.



They conclude that arterial hypertension is not associated with any characteristic symptomatology and that it is referable to a disturbance of the central nervous system and is an expression of a disordered vasomotor system. They also refer to the importance of psychic conditions in the etiology.

F. D. Murphy and J. Grill<sup>2</sup> report 16 cases of malignant hypertension; 13 patients died, and the post-mortem evidence is given in 12. The chief symptoms were headache, profound loss of weight, the functional failure of one or more essential organs, characteristic changes in the retina, and a progressively downward course. In 11 out of the 12 cases the kidneys were granular and smaller than normal. In one case only, with a history of four years, both kidneys were larger than normal, and the surfaces were smooth, though studded with petechial hemorrhages. The essential lesions of the body were arteriosclerotic. The smallest arteries and arterioles were extensively affected. There was generalized medial hypertrophy.

The part played by infections and focal sepsis in the etiology of hypertension has probably been overrated. F. R. Nuzum and A. H. Eliot<sup>3</sup> found that when renal impairment was evident there was frequently a history of scarlet fever or acute nephritis, but that amongst the patients suffering from essential hypertension previous infection and focal sepsis were not more frequent than among a series of control cases. They found also that there was no familial factor, and that arteriosclerosis of the larger vessels was not common along with hyperpiesis. Obesity, however was twice as common in patients with hypertension as in a control group.

**TREATMENT.**—Several writers recently have laid stress on the importance of the psychological factor both in the causation and the treatment of hyperpiesis. J. F. Halls-Dally<sup>4</sup> advocates the creation of a **Congenial Psychical Atmosphere** and the cultivation by the patient of an equable, cheerful, and balanced temperament. Occupations of steady routine are to be preferred to those that involve constant anxiety and sudden fluctuations. Light reading or other distraction is useful in getting rid of worries before retiring to rest. He also advises that not less than eight hours should be spent in bed, a rest period after meals when possible, and holidays that secure pleasant surroundings and conditions that will make for as much mental relaxation as possible.

D. Ayman<sup>5</sup> makes an interesting contribution to the subject of the value of remedies in the treatment of hypertension, which should be taken in conjunction with what has been said about psychological treatment of this disorder. He analyses thirty-five articles dealing with the treatment of this disease by different remedies, and shows that in practically every one symptomatic relief, complete or partial, is reported. A moderate reduction of blood-pressure is the main result, and only occasionally a marked reduction. The symptomatic relief is above the degree of blood-pressure reduction. The author has studied a group of 40 patients, the subjects of hyperpiesis, whose symptoms were not due to secondary or demonstrable changes in the vascular system. All had five records of abnormally high pressure and had been previously observed for at least two months. These patients were given a careful examination and all their symptoms were minutely inquired into. "The next step was to prescribe seriously and enthusiastically 10 drops of dilute hydrochloric acid to be taken in half a glass of water 15 minutes before meals 3 times a day." Thirty-three out of the patients, or 82 per cent, showed an unmistakable improvement. The symptoms were very various, insomnia, headache, nervousness, fatigue, loss of appetite, and dizziness. The majority of these symptoms, however, the author considered as functional, and to be remedied at need by functional methods of treatment.

A. G. Rowntree,<sup>6</sup> in a general discussion on hyperpiesis at the American

Medical Association, emphasizes the importance of an **Initial Rest Period**, during which he has noticed very great diminution in the pressure in a majority of cases. Estimations taken at hourly intervals have proved that in a proportion of cases the blood-pressure during sleep falls to normal limits, whereas in the malignant type it remains high. Most clinicians have noticed that patients in the initial stages of hyperpiesis show varying figures; sometimes the pressure may be found to be normal. These are the cases in which an initial period of rest is probably very beneficial. At the same discussion A. M. Mortensen makes the suggestion that hyperpietic patients should be studied carefully from the point of view of their nervous reactions and temperaments, so as to endeavour to eliminate fear and other forms of anxiety.

Treatment of hypertension by **Sodium** or **Potassium Thiocyanate** (2 to 10 gr. thrice daily from one to four weeks) is now generally employed. J. F. Borg<sup>7</sup> records the results of 24 cases: 2 patients failed to show reduction of pressure—one who was found to have tertiary syphilis and reacted to anti-syphilitic therapy, and another who had severe kidney injury. In 9 patients, however, there was no reduction in the diastolic pressure. The reduction of pressure was seen from three days to a month after treatment had begun. Discontinuance after the lowered pressure had been maintained for a week showed that the lower figures persisted in a varying degree from a few days to two months. The reduction of pressure is not wholly without unpleasant complications. Four of the 24 patients developed toxic psychoses, which disappeared after the drug had been discontinued for some days.

REFERENCES.—<sup>1</sup>*Amer. Jour. Med. Sci.* 1930, July, 47; <sup>2</sup>*Arch. of Internal Med.* 1930, July, 75; <sup>3</sup>*Amer. Jour. Med. Sci.* 1931, May, 630; <sup>4</sup>*Practitioner*, 1931, Jan., 39; <sup>5</sup>*Jour. Amer. Med. Assoc.* 1930, July 26, 246; <sup>6</sup>*Ibid.* Sept. 20, 846; <sup>7</sup>*Abstr. in Jour. Amer. Med. Assoc.* 1930, June 21, 2022.

### BLOOD-PRESSURE, LOW.

A. G. Gibson, M.D., F.R.C.P.

E. N. Chamberlain<sup>1</sup> sums up what we know about low blood-pressure. In the first place he shows from a series of records in normal students that a low blood-pressure is not abnormal under conditions of complete health and good physique, in athletic or unathletic individuals. The lowest pressure he records is 88 max., 78 min., in a student aged 20, of good physique, taking moderate exercise. Conditions under which low blood-pressure is met with in clinical work are as follows: It occurs in shock, in hæmorrhage, and in the anæmias. It is seen also in some of the infections, such as pneumonia and typhoid fever. In typhoid fever a sudden fall is indicative of hæmorrhage, whilst in perforation the blood-pressure shows an early rise. Influenza is often followed by a persistence of hypotension for a prolonged period associated with lack of energy and other symptoms of deficient circulation. Pulmonary tuberculosis also shows a low blood-pressure. In cardiovascular disorders low blood-pressures are seen in coronary thrombosis and a low diastolic pressure is present in aortic regurgitation; it is said also to occur in heart-block. In Addison's disease in the late stages there is a persistent hypotension. An essential hypotension is said to occur mainly in women between 20 and 40, associated with headaches and lack of endurance both mental and physical. In regard to the treatment of hypotension, shock and hæmorrhage require the restoration of blood-volume by ample **Fluids** and, if necessary, subcutaneous or intravenous injections. Of the latter, injection of **Gum Acacia** and **Transfusion** are probably the best. Anaphylactic shock is best treated by injections of **Adrenalin**. The persistence of hypotension following injections is most usually got rid of by fresh air and graduated exercises. The hypotension of Addison's disease is very resistant to treatment.

REFERENCE.—<sup>1</sup>*Liverpool Med.-Chir. Jour.* 1930, ii, 255.

**BONE TUMOURS: MULTIPLE MYELOMA.** (*See also* PARATHYROID GLANDS.)*E. W. Hey Groves, M.S., F.R.C.S.**S. J. H. Griffiths, F.R.C.S.*

Diffuse myelomatosis of bones, first described by Rustitzki in 1873, is a rare disease in which there is multiple tumour formation in the marrow of the bones. The condition seems to have a predilection for the vertebrae, sternum, and ribs. The diffuse deposits are in no way allied to the ordinary single myeloma found in the long bones. The bones are softened and the osseous tissue disappears, resulting in horrible, painful deformities. A case of an old lady of 65 has recently come to the knowledge of one of us (S. J. H. G.). The bones largely affected were the sternum, ribs, and vertebrae, and in less than a year the sternum has become bent on itself almost to a right angle, with a corresponding amount of kyphosis.

In the differential diagnosis of the disease skiagrams are helpful, and the multiple punched-out looking areas are fairly typical, although it is by no means easy to diagnose the condition from diffuse carcinomatosis of bones by means of X rays. In the latter condition there are no Bence-Jones proteoses in the urine, whereas they are almost always found in the condition under discussion. All forms of treatment have been hitherto considered futile, and it is interesting to read an article by W. B. Coley,<sup>1</sup> of New York, on the use of the mixed toxins of erysipelas and *Bacillus prodigiosus* together with the effects of radiation in the amelioration of this condition, the treatment in some cases causing disappearance of the tumours. He quotes one case which was alive and well for five years after a course of the **Mixed Toxins** had been given twice a week for two years. The patient subsequently died of acute lobar pneumonia. The exact diagnosis was established by microscopical evidence, and this case appears to be the only one on record of multiple myeloma that has recovered under any form of treatment.

REFERENCE.—<sup>1</sup>*Ann. of Surg.* 1931, Jan., 77.

**BOVINE TUBERCULOSIS IN MAN.** (*See* TUBERCULOSIS, BOVINE, IN MAN.)**BREAST, SURGERY OF.***Sir W. I. de C. Wheeler, F.R.C.S.I.*

**Carcinoma of the Breast.**—A number of surgeons have come to the conclusion that breast cases should be treated by **Radium** in preference to the knife. The cases must, of course, be reasonably early; good results have been obtained when the disease has not travelled farther than the neighbouring glands. No form of treatment will result in a cure when the disease has reached the interior of the thoracic or abdominal cavities.

D. C. L. Fitzwilliams<sup>1</sup> gives an interesting account of his experience with radium in breast cancers. The growth is attacked from its deep surface, as a larger dose can be given without affecting the skin. Needles are inserted behind the growth, if possible between the gland and the pectoralis major. Two layers of needles are used at right angles to each other so as to form a gridiron behind the tumour (*Figs. 13, 14*).

Fitzwilliams finds that the best plan is to use needles 6 or 8 in. long. In large tumours, at the end of three days the radium needles can be drawn farther along so that the whole area is radiated. The remaining portion of the breast is punctured by needles arranged in a circular manner, their points converging on the growth so as to ensure the whole breast being irradiated. Lastly, in large tumours, a tube of 25 mgrm. of radium is thrust into the tumour. The distribution of the needles depends to some extent on the position and size of the tumour. This writer says that the radical mutilating

operation in which he was trained is becoming with him a thing of the past. He states that Paget's disease reacts remarkably well to radium. He punctures the breast with needles about an inch beyond the ulcerated area, the needles converging slightly beneath the nipple. The effect of radium on fungating malignant ulcers, he states, can only be described as miraculous. Long needles are thrust into the base of the mass from outside its edge; shorter

needles are thrust into the floor of the ulcer. Tubes ranging from 25 to 45 mgrm. are placed in pockets, if such exist.

Treatment by radium is fast passing into the hands of experts, but it is well to realize that hopeless cases of cancer of the breast can be treated with temporary success by this method.

G. Keynes,<sup>2</sup> in dealing with the same subject, does not claim that radium has superseded surgery. He believes that it is the treatment of choice as a first stage in the majority of patients. For those with inoperable tumours it is the only possible treatment; for those with the earliest growths it is the preferable treatment. From a study of 130 cases he states that the results to be expected from radium are at any rate as good as those obtained by operation, and perhaps somewhat better.

The technique recommended by Keynes is that known as 'interstitial irradiation'. A large number of needles, each containing a small amount of radium (never more than 3 mgrm.) are placed in the tissues and are allowed to remain in position for a relatively long time, seven days being the standard period of irradiation. Plate VIII shows the distribution of the needles. The treatment of the primary growth is achieved by placing needles about

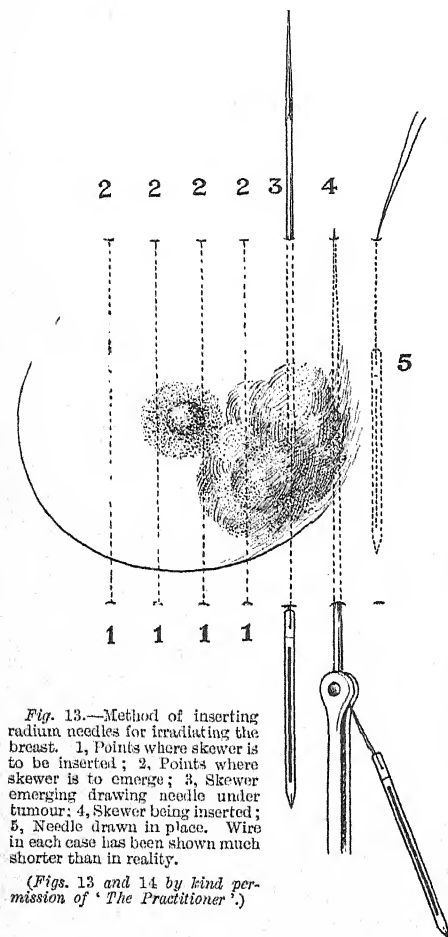


Fig. 13.—Method of inserting radium needles for irradiating the breast. 1, Points where skewer is to be inserted; 2, Points where skewer is to emerge; 3, Skewer emerging drawing needle under tumour; 4, Skewer being inserted; 5, Needle drawn in place. Wire in each case has been shown much shorter than in reality.

(Figs. 13 and 14 by kind permission of 'The Practitioner'.)

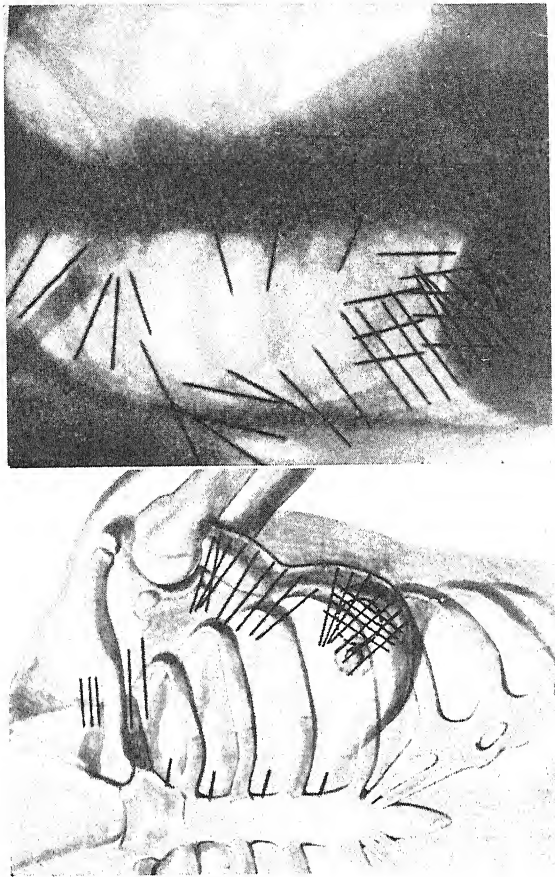
1.5 cm. apart in the cellular tissue underneath the breast; it is well to avoid pushing needles into the growth itself. The treatment of the lymphatic areas consists in placing needles in a series of groups, under the pectoralis major muscle, in the axilla, below the clavicle, above the clavicle, and in the upper three or four intercostal spaces. The intercostal needles extend a short way into the anterior mediastinum so that the emanation reaches the parasternal gland in each intercostal space.

W. Sampson Handley<sup>3</sup> points out that about the time when the axillary

## PLATE VIII

### RADIUM TREATMENT OF CANCER OF THE BREAST

(G. KEYNES)



Showing distribution of the radium needles in the lymphatic areas and in the region of the tumour.

*By kind permission of 'The Practitioner'*



glands are infected, cancer cells in a large number of cases obtain access also to the parasternal glands which lie within the chest along the course of the internal mammary artery. For this reason he became convinced that operative treatment alone was inadequate in breast cancer. Handley thinks it is necessary to await the slow process of time before radium can be accepted as a substitute for operation. He thinks that the administration of a lethal and uniform dose of radiation over a large area and volume of tissue is a difficult and uncertain matter. He mentions the deleterious action of a massive dose of radium upon the heart. In patients advanced in years and with a left-sided carcinoma, operation is safer than radium. He concludes his paper with an interesting reference to diathermy.

*Diathermy in Breast Cancer.*

—It is perhaps not yet generally realized how great are the advantages which the diathermic needle presents over the scalpel in the removal of breast cancer, as indeed in many other fields of surgery. The method represents not a mere optional variation in technique, but a striking improvement. Its advantages depend mainly upon three peculiarities of diathermic cutting: (1) That it seals most of the small vessels as it cuts them and so minimizes loss of blood; (2) That it divides nerves almost without stimulating them and leaves their exposed ends insensitive; (3) That during the operation it supplies heat to the body generally and especially to those parts which are exposed for the purposes of the operation. The three principal causes of operative shock—namely, violent nerve impressions, loss of blood, and loss of heat—are thus minimized.

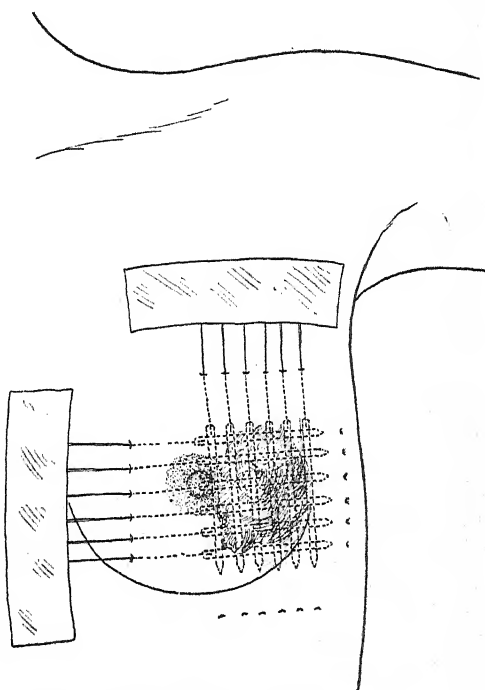


Fig. 14.—Gridiron in position. Other needles surrounding tumour and lying along lymphatics are not shown.

It is not so much the methods of treatment, which have become more or less standardized, with which the patient and surgeon are concerned—the results are the all-important factor. The statement that radical operation was followed by recurrence in approximately 70 per cent of the cases when the axillary glands were involved is probably true, and, conversely, about 70 per cent of the cases after complete radical operation remain without recurrence after five years when no glandular involvement was found at the time of operation. Every surgeon feels, however, that the prognosis in any case of cancer of the breast is an extremely difficult matter.

B. F. Schreiner<sup>4</sup> believes that the word 'cure' as applied to cancer should be

eliminated from the literature and the words 'clinically well' be substituted. He found in 46 *early* cases without glandular involvement treated by operation and radiation, that 65 per cent have remained clinically well for five years or more. Of 14 cases treated by radiation alone, only 4 (28 per cent) have remained clinically well for five years or more. Of 43 cases *with glandular involvement* treated by operation and radiation, 23 per cent have remained clinically well for five years or more. Of 69 cases treated by radiation alone, only 1 (1.4 per cent) has remained clinically well for five years or more. He is convinced that irradiation is of distinct value in the retardation of the growth, in the amelioration of suffering, and in the prolongation of life. The method employed by Schreiner was to divide a known quantity of **X Rays** over a period of a week to twelve days. Radium was employed in a few cases.

M. Lens<sup>5</sup> states that pain usually preceded positive X-ray findings of skeletal metastases and was the most important symptom of skeletal invasion. Metastases to the central nervous system from cancer of the breast occurred in about one-fifth of the cases investigated. In more than half of the brain cases there were associated metastases in the skull. In the spinal-cord cases there were metastases in the corresponding vertebrae.

A. D. Bevan<sup>6</sup> deals with the problem of tumours of the breast from the standpoint of general practitioner and surgeon. He says that tumours of the breast occur in about 3 women in 100. He states that in 300 consecutive cases of women presenting themselves with the problem of tumour of the breast, 100 will not have a tumour at all, 100 will have a benign tumour, and 100 will have a malignant tumour. In the first group the patient often has a normal but lobulated breast or has been recommended removal of the breast by a surgeon who lacks solid ethics. The operation is recommended because the patient comes to him in the fear of cancer when no cancer and no tumour exists. Bevan states that the essential benign tumours of the breast are fibroadenomas and fibrocystic disease. The malignant tumours are carcinomas in all but 1 or 2 per cent of the cases, and these are sarcomas. To make the diagnosis between malignancy and non-malignancy, the patient should be in the erect or sitting position. The finding of a tumour in the recumbent position is more difficult. The first examination consists in ascertaining whether the tumour is freely movable or fixed in the breast tissues. The malignant tumours are fixed and frozen into the breast tissue, and the mammary gland moves with the tumour. Dimpling of the skin over the lump and retraction of the nipple almost invariably mean cancer.

The fact is that the production of fibrous tissue in carcinoma of the breast, however early, is responsible for most important diagnostic signs. In the first place, the tumour feels hard, later the contraction of the fibrous tissue extending along the suspensory ligament causes retraction of the nipple. The fibrous attachment to the deep surface of the skin causes wrinkling. Further contraction of fibrous tissue often raises the diseased breast to a higher level than normal, and, owing to a similar contraction, it may be smaller than the healthy breast on the opposite side.

In *Paget's disease* there is usually no palpable tumour in the breast, but in advanced cases there may be one. The nipple is the site of an eczematous skin lesion. It is retracted, bleeds easily, and is surrounded with a red weeping integument. It is a carcinoma beginning in the milk ducts and extending to the skin around the nipple. The eczema is secondary to the carcinoma. It must be treated by **Radium or Radical Amputation**.

In dealing with tumours of the breast, in one case out of ten the experienced surgeon may be uncertain and an exploratory incision down on the tumour



# PLATE IX

## MASTECTOMY FOR HYPERTROPHIED BREASTS

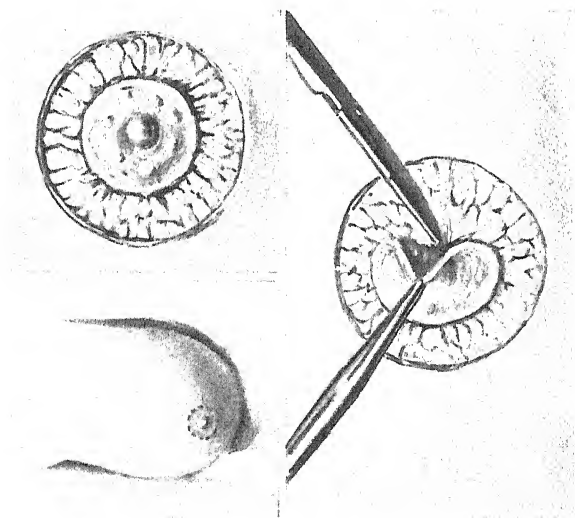


Fig. 4.—Dissection of graft.

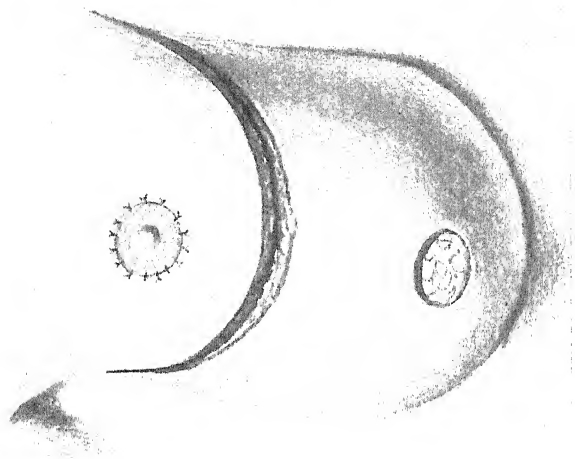


Fig. 5.—Upper flap dissected up, areola graft already transplanted.

Plates IX and X by kind permission from G. Gordon-Taylor's 'The Dramatic in Surgery'.

# PLATE X

## MASTECTOMY FOR HYPERTROPHIED BREASTS—continued

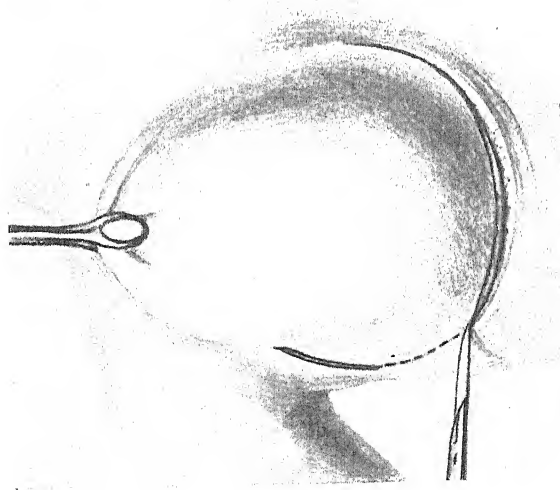


Fig. C.—The massive breast is forcibly raised, and the inferior portion of the incision for the removal of the mamma is marked out.

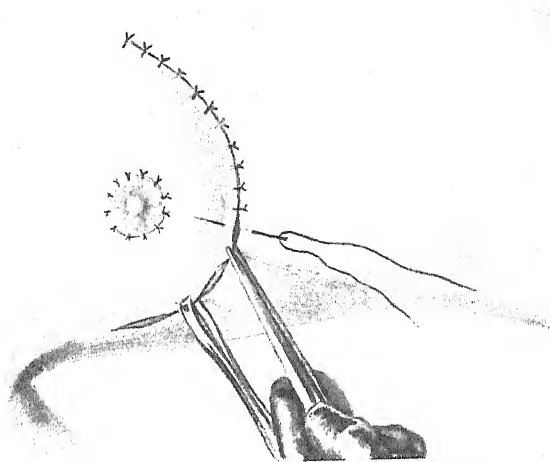


Fig. D.—Operation nearing completion: suture of the two flaps; the nipple and reduced areola have been grafted into their new bed.

is necessary. In 95 per cent of cases the character of the tumour may be determined by its gross appearance on section.

Bevan states that one seldom sees a carcinoma develop in a breast from which a tumour proved to be benign has been removed. As already stated, the reviewer has seen such cases. As regards prognosis, Bevan believes that in cases without glandular involvement 75 per cent are cured by the radical operation. When the axillary glands are involved he brings the percentage of cures down to 10 per cent, and if they are involved above the clavicle the percentage of cures is zero. He recommends a thorough course of roentgen treatment after operation, not in massive doses but in very moderate doses continued for some time. He has seen great injury done by massive doses—fibrosis of the lungs and extensive burns.

**Removal of Non-malignant Tumours ; Hypertrophy.**—The upper limit of the incision lies beneath the anterior axillary fold and it extends downwards from this for about five or six inches. When the lymphatic tissue has been divided the margin of the great pectoral muscle is exposed and defined. The breast is rotated so as to bring its deep surface into the wound.

When more extensive resections are required the preservation of the nipple is important for psychological and æsthetic reasons. G. Gordon-Taylor<sup>7</sup> states that the removal of a breast is keenly felt by the majority of women as a peculiar indignity, but it is necessary to remove a ponderous mammary organ as a measure of relief and to prevent the risk of supervention of malignant disease. *Plates IX, X* show how, when the hypertrophied breast is removed, the nipple can be taken from the removed specimen by a circular incision and transplanted in its normal position above the scar line.

Lilian K. P. Farrar<sup>8</sup> states that the first mastectomy recorded for prolapsed hypertrophied breast was probably that done in 1669 by Durston. The breast weighed 64 lb. This writer states that Kraske seems to have been the first to describe a plastic operation for virginal atrophic prolapsed breasts. The prolapse was attributed to the loss of fat in the breast tissues owing to malnutrition. The probability is in modern times that the breasts have been forced down by the mode of dress. The writer believes in conservative treatment—in other words, the use of a properly applied breast support. This should be made of a light elastic webbing and fastened by elastic lacings in the back with two firm straps over the shoulders.

**Transillumination of the Breast.**—Max Cutler<sup>9</sup> points out that, just as a hydrocele transmits light, a cyst of the breast with clear fluid will transilluminate with equal facility. If the cyst contains blood and is opaque, malignancy should be suspected. The dangerous cysts are those of microscopic dimensions. Unless transillumination is performed in a totally dark room, the result of the examination is not satisfactory. The general scheme is to place the light directly beneath the lesion ; thus tumours attached to the chest wall are not amenable to this form of examination. The most formidable source of error is the over-illumination of small solid tumours, thereby establishing a false translucence. Fat is highly translucent. Small flat non-pendulous breasts are unsuitable for transillumination. The lactating breast is totally opaque to transillumination. Readers of Cutler's communication are reminded that some investigators hold that a hæmorrhagic discharge from the nipple of a non-lactating breast is evidence of a benign rather than a malignant lesion and is an almost positive sign of intracanalicular papilloma. The probability is that about half of these cases are malignant and the other half are not. An intracystic papilloma which is accompanied by a hæmorrhagic discharge from the nipple presents a discrete and well-circumscribed opacity

when transilluminated. When there are multiple papillomata, transillumination presents a striking picture consisting of multiple small opacities. The opacities are intense, discrete, and localized.

REFERENCES.—<sup>1</sup>*Practitioner*, 1930, Oct., 483; <sup>2</sup>*Ibid.* 462; <sup>3</sup>*Ibid.* 453; <sup>4</sup>*Ann. of Surg.* 1931, Jan., 269; <sup>5</sup>*Ibid.* 278; <sup>6</sup>*Jour. Amer. Med. Assoc.* 1930, Nov. 1, 1311; <sup>7</sup>*The Dramatic in Surgery*, 1930, c2, Bristol, John Wright & Sons Ltd.; <sup>8</sup>*Jour. Amer. Med. Assoc.* 1930, Nov. 1, 1329; <sup>9</sup>*Ann. of Surg.* 1931, Jan., 223.

**BRIGHT'S DISEASE.** (See RENAL DISEASE.)

**BROMIDE INTOXICATION.** (See ALCOHOL AND DRUG ADDICTION.)

**BRONCHIECTASIS.** (See also LUNG, ABSCESS OF.)

W. H. Wynn, M.D., F.R.C.P.

C. McNeil, A. R. Macgregor and W. A. Alexander<sup>1</sup> have studied microscopically the changes in the bronchi in acute and chronic cases of bronchopneumonia to throw light on the origin of bronchiectasis. They find that acute bronchiectasis may be due to two entirely distinct types of change: (1) A destructive change in the walls of the bronchi in severe cases of bronchopneumonia which leads to permanent changes in the lungs; and (2) Pure dilatation with acute overstretching of the wall of the bronchus unaccompanied by any important structural change. The second type, which is very common in acute bronchopneumonia, affects small bronchi in the consolidated areas and also those in unconsolidated parts. The writers suggest that the term 'acute bronchiectasis' should be restricted to this condition of true dilatation. As regards chronic bronchiectasis, the first stage of the process was found in a case of prolonged bronchopneumonia, in which a very severe purulent bronchitis was an outstanding feature, and acute interstitial inflammation of the bronchial walls was more than usually intense. Observations made on this and other cases showed that the acute interstitial inflammation going on to necrosis and suppuration causes the formation of a cavity by loss of tissue from the bronchus wall, and usually the excavation of a certain amount of adjacent alveolar substance. Subsequently the cavity is lined by granulation tissue, becomes fibrous, and finally may be covered by bronchial epithelium, usually of modified type. According to this view, a bronchiectatic cavity is not a dilated bronchus but an excavation in the lung substance starting in a bronchus. It is not suggested that this explains all cases, but it seems to be true of cases which can be clearly traced to an antecedent acute respiratory infection.

H. Brunn and W. B. Faulkner<sup>2</sup> describe two types of bronchiectasis: (1) Cases of short duration which usually give a history of several severe influenzal attacks, this disease seeming to have a particularly weakening effect on the bronchial wall; and (2) Cases of much longer duration which appear to have begun in early childhood. These are the commoner type, and in these they believe that chronic sinusitis plays a considerable part in keeping up the recurrent infection which leads to the final bronchiectasis.

D. Smith<sup>3</sup> believes that the degenerating action of Vincent's spirochaetes on the bronchial walls is responsible for their dilatation in much the same way as the spirochaetes of syphilis are responsible for aneurysm of the aorta.

Since the introduction of lipiodol injection it has been possible to demonstrate bronchiectasis in cases in which the amount of sputum has been negligible. These cases have been termed by Bezancon '*bronchiectasis sicca*'. This condition, which implies little or no infection in the bronchial walls, is

usually encountered in an upper lobe in which the drainage is downwards towards the hilus, but it may occur in a lower lobe.

A. J. Scott Pinchin and H. V. Morlock<sup>4</sup> have seen fifteen cases in the last two years. These cases have little or no cough or sputum and no clubbing of the fingers—an indication that clubbing is due to toxic absorption. As hæmoptysis is the main symptom there is a tendency to diagnose these cases as tuberculous. The hæmoptysis is usually copious, from 3 to 15 oz. Such a large amount is not commonly seen in an initial hæmoptysis in pulmonary tuberculosis. In association with the hæmorrhage there is an absence of constitutional signs. The hæmorrhages are usually recurrent. One of these authors' patients worked as a domestic servant for the previous seven years, having large hæmorrhages every few months, and, except for a day or two's rest on each occasion, continued her duties. Other cases were treated in the out-patient department during the period they were having hæmorrhages. The physical signs are indefinite, and it is often impossible to detect anything more than a slight fibrosis, the interpretation of the signs often being made more difficult by the fact that there had been an empyema or pneumonia in the past on that side. The majority of the patients give a history of a previous inflammatory condition of the lung. It is possible that most cases of bronchiectasis begin as the dry type and become infected at varying periods. The interval between the acute illness and the hæmorrhage which brought the patient for advice is instructive, as long as twenty, fourteen, and eight years elapsing in three of the cases. In none of the cases reported has any radical measure been undertaken for treatment, as all the patients were in good condition. If hæmoptysis threatens life, phrenic avulsion or pneumothorax must be considered.

M. Jacobs and L. Dodies<sup>5</sup> use **Campiodol** instead of lipiodol for injection into the bronchi. This new compound is iodized rape-seed oil. It contains from 40 to 43 per cent of iodine and has a very low viscosity so that it flows freely through a fine needle. *In vitro* the oil converts the thick sputum into a considerably more limpid material, partly by emulsifying the sputum and partly by enveloping and infiltrating it so that it separates from the walls of the containing vessel. In one test, contact with oil for thirty minutes reduced the time of flow of sputum for a given distance from thirty to two seconds. This should make postural drainage and coughing more effective. It should not be injected into patients with pulmonary tuberculosis, marked cardiac disturbances, hyperthyroidism, or acute chest conditions. Patients were given six to nine injections once a week, and it was found that cough and sputum diminished and physical signs improved. The oil was injected with an ordinary syringe placed at the back of the tongue after anesthetizing the fauces with cocaine.

F. S. Mainzer<sup>6</sup> uses **Bronchoscopic Aspiration** at weekly intervals until there is complete relief of symptoms. After each aspiration he injects into the bronchi 10 c.c. of a solution containing **Monochlorophenol** 9 gr., **Camphor** 5 gr., **Oil of Geranium** 2 drops, **Olive Oil** 1 oz. He also prescribes **Ammonium Chloride** to thin the secretion, and monochlorophenol in 2 per cent solution in an atomizer to relieve the upper respiratory irritation.

Chevalier Jackson<sup>7</sup> stresses the importance of *infection of the nasal sinuses* in bronchiectasis. If the patient has an incurable focus in the sinuses, it is useless to expect more than palliation of the secondary suppuration in the bronchi. He also points out that many of the failures to obtain satisfactory results from **Vaccine Therapy** are due to the use of vaccines prepared from secondary invaders. His results have been incomparably better since he rejected all the pus from the trachea and bronchi above the focus. The focal

pus is separately aspirated for bacteriological study and the preparation of vaccines because it usually contains the most important organisms.

REFERENCES.—<sup>1</sup>*Arch. of Dis. Child.* 1929, iv, 170; <sup>2</sup>*Amer. Rev. Tub.* 1929, xix, 191; <sup>3</sup>*Jour. Amer. Med. Assoc.* 1930, Jan. 4, 23; <sup>4</sup>*Brit. Med. Jour.* 1930, ii, 315; <sup>5</sup>*Med. Jour. and Record*, 1931, Feb. 18, 187; <sup>6</sup>*Amer. Jour. Surg.* 1931, Jan., 93; <sup>7</sup>*Proc. Roy. Soc. Med.* 1930, Nov., 1.

A. Tudor Edwards, M.Ch., F.R.C.S.

Considerable pathological work has been carried out in recent years to determine the etiology and micropathology of bronchiectasis. Most of this has been done in America, and amid a large number of articles the following appear to shed some light on this somewhat obscure subject.

C. A. Hedblom,<sup>1</sup> in discussing the pathology of bronchiectasis, emphasizes the mechanical factor although recognizing the infective agent which weakens the bronchial wall. In his opinion atmospheric pressure is the most important if not the only mechanical factor causing bronchial dilatation in the absence of marked pathological changes in the lung parenchyma or pleura.

In discussing diagnosis, Hedblom states this can only be made by lipiodol injection and X-ray examination, as both symptomatology and physical signs are often unreliable.

Collapsing operations such as **Phrenic Evulsion**, **Pneumolysis**, and multiple-stage **Thoracoplasty** are advised, especially in the early stages. He states that pulmonary collapse not only arrests the dilating process but also brings about a partial collapse of the dilated bronchi. Cicatricial contraction of fibrous tissue already present, and secondary fibrosis that results from long-continued collapse, promote complete obliteration of the diseased bronchi.

REFERENCE.—<sup>1</sup>*Surg. Gynecol. and Obst.* 1931, Feb., 406.

## BURNS AND SCALDS.

Sir W. I. de C. Wheeler, F.R.C.S.I.

The treatment of burns and scalds is best carried out with a freshly-made solution of 2½ per cent **Tannic Acid**, either applied by means of a spray every hour until the whole surface becomes tanned, or by means of dressings soaked in the solution and kept constantly wet. The collosol form of tannic acid is now on the market in ampoules, together with a very convenient spraying apparatus which fits on the top of the opened ampoule (Crookes).

It has been pointed out on a previous occasion that the finger-tips should not be sprayed with tannic acid, as gangrene sometimes results, and tannic acid should also be avoided near the anal or oral margins, owing to the likelihood of infection underneath the scab. Great care must be taken in protecting the eyes if tannic acid is being applied to the face.

C. Donald<sup>1</sup> refers to the fact that the death-rate for burns in children amounted in some institutions to 38·7 per cent in 1926. This mortality is abnormally high. He also refers to the strong advocacy in certain quarters of tannic acid solutions, which—~~theoretically at least~~—imprison the toxins within a scab, and he adds that in the London Hospital there has been a progressive fall from 26 to 5 per cent without the aid of tannic acid. He thinks that tannic acid is no better than any other local application in combating toxæmia. Its advantages seem to be more in the production of a scab which obviates painful dressings. He says that immediate tannic acid applications where the burned area cannot be thoroughly cleansed beforehand seem not only futile but dangerous. More faith is placed in the neutralization of the toxæmia by the introduction of fluids into the circulation than in its prevention by any local application at present known. The administration of

fluids is a most important addition to any local treatment. **Alkalis** and **Glucose** should be administered freely in the same way as in all other cases of shock and toxæmia.

REFERENCE.—<sup>1</sup>*Lancet*, 1930, ii, 949.

**BURSITIS, INJECTION TREATMENT OF.** (*See* INJECTION TREATMENT.)

**CANCER.** (*See* CHEMOTHERAPY OF CANCER; RADIUM TREATMENT OF CANCER; *also under various organs, etc.*)

**CANCER: THE BENDIEN TEST.** *Beckwith Whitehouse, M.S., F.R.C.S.*

The premature publication in the lay press of a serological method elaborated by S. G. T. Bendien for the diagnosis of carcinoma has been received by the medical profession with characteristic caution. That the subject is one which calls for very careful investigation with a view to confirmation or otherwise, no one will deny. Such work is at present being carried out in various centres, and until the results of these observations are made known it is impossible to view Bendien's work in its true perspective. As a matter of fact, in his book recently published,<sup>1</sup> a translation of which by A. Piney is, we understand, shortly to be available, the author makes no special claim for the specificity of the serum test for carcinoma alone. He describes a method of examination of the blood serum, partly chemical and partly spectrophotometric, which produces changes characteristic of tuberculosis, carcinoma, and some other diseases.

The *chemical test* is conducted by mixing the patient's serum with a series of mixtures of sodium vanadate and acetic acid in varying proportions. These are numbered 1 to 20, and with the blood of normal individuals a precipitate occurs only with the mixture labelled '6' and with more alkaline mixtures. Should carcinoma or certain other disease be present, a precipitate is thrown down with the more acid mixtures also.

F. Campbell Smith, E. R. Holliday, and J. Marrack<sup>2</sup> have recently published a report upon the investigation of the sera of 49 patients at the London Hospital, including 12 normals and 15 suffering from carcinoma. Of the normal sera only one gave a slight precipitate with mixture '5'. All the sera of diseased patients, *except one with sarcoma*, gave a precipitate with mixture '5'.

The results of 4 chemical tests by J. Fine,<sup>3</sup> from the County Laboratory, Stafford, are interesting. Serum 1 was taken from a patient diagnosed as coronary heart disease. The Bendien test was 'positive', and later symptoms of pulmonary neoplasm developed, confirmed by radiograph. Serum 2, from a case of mammary carcinoma without metastases, and operated upon two months previously, was 'negative'. Sera 3 and 4, from patients with gastric ulcer, were both 'negative'. Fine draws attention to one difficulty in the test, in the large amount of blood serum (10 c.c.) which is required; and he is now cutting down all the quantities to one-fifth. By using 0.1 c.c. of serum with 0.1 c.c. of distilled water and 1 c.c. of the acetic-acid-sodium-vanadate mixture, at the same time omitting tubes 11 to 20, he finds it possible to carry out the test with 1 c.c. of serum only.

The *spectrophotometric test* is complicated and costly (£384 is the present quotation!—Adam Hilger Ltd.), and its application is therefore likely to be limited. The method has been investigated by F. Campbell Smith<sup>2</sup> and his co-workers, and their conclusions to date are that the test is unreliable. In fact they "feel confident that the spectrophotometric method applied to Dr. Bendien's solutions has no value in the diagnosis of cancer." In view of this

rather sweeping statement it appears advisable to await the result of further reports before describing the technical details of what must always be a highly complicated and specialized test.

REFERENCES.—<sup>1</sup>*Spezifische Veränderungen des Blutserums*, 1931, Jena, Gustav Fischer; <sup>2</sup>*Lancet*, 1931, ii, 507; <sup>3</sup>*Brit. Med. Jour.* 1931, ii, 514.

## CARBON MONOXIDE POISONING.

G. E. Oates, M.D., M.R.C.P., D.P.H.

Accidental carbon monoxide poisoning is common in countries, such as Turkey, where charcoal fires are in use. In Great Britain this form of poisoning is generally suicidal. Apart from fatal cases, chronic poisoning with CO is probably more common than is generally imagined. J. S. Haldane<sup>1</sup> summarizes modern knowledge on this topic. Carbon monoxide is a dangerous poison because it has no odour or irritant action. It forms a stable compound with hæmoglobin, replacing to a large extent the oxygen loosely combined, and so paralysing the action of hæmoglobin as an oxygen-carrier. Haldane has shown that the poisonous effects of CO are not direct, but entirely due to oxygen deprivation. In CO poisoning the prolonged and severe want of oxygen, if not fatal, may cause serious after-effects. These are of varied character, including severe headache, nausea, symptoms of heart affection, hæmorrhage into the central nervous system, neuritis, and attacks of pneumonia. An early symptom of chronic poisoning is fainting or loss of power on exertion, accompanied by headache. As the saturation of the blood with CO proceeds certain mental symptoms appear. One of these is impaired memory of what has just happened. Hence the subject's conduct may be quite irresponsible. A miner engaged in rescue operations persists in his work without paying attention to symptoms which he knows to be dangerous. Indeed, the lapses of memory may be filled in by imaginary events, described in good faith. The gait becomes drunken and the hand-writing irregular. Sensory perceptions of all kinds are dulled, and miners may receive without any pain bad burns from lamps which they are carrying. The mental and moral deterioration in CO poisoning takes different forms in different persons. Some become torpid, some hilarious, quarrelsome, or dangerous. It is of the utmost importance to recognize that the symptoms and after-effects of CO poisoning are very similar to those of drunkenness. Haldane relates a case in which the driver of a motor-car was tried for being drunk in charge of his car. His two companions were supposed to have died of the combined effects of alcoholic intoxication and cold. The driver was drowsy and his vomit smelt of beer. Fortunately a doctor who attended the necropsies on behalf of the driver noticed the red colour of the blood in the corpses. He took a sample of it, and it was found to be highly saturated with CO. The driver was acquitted. The explanation of the tragedy was that the car had stuck in water which had overflowed a road, and that the engine was kept going for some time, with the exhaust-pipe under water, in vain attempts to extricate the car. The two passengers were left for dead by the police, who were occupied in arresting the driver.

The post-mortem appearances of CO poisoning, with the lips red and the blood of the familiar cherry-red colour immediately on exposure to the air, are well known. In certain cases, however, patients die from the after-effects of CO poisoning and no CO is present in the blood, since there has been ample time to get rid of the gas. The only condition simulating in certain respects the colour of the blood in CO poisoning is nitrite poisoning. Here the blood contains methæmoglobin during life, with the appearance of ordinary cyanosis. After death the red colour due to nitric-oxide-hæmoglobin appears, the methæmoglobin being reduced. The relative affinity of CO and oxygen



for the haemoglobin of the blood is about 300 to 1. Upon this depends the facts that treatment must be long-continued before it is abandoned, and that recovery without proper treatment is unlikely.

As regards poisoning with ordinary illuminating gas, Haldane considers that it is difficult, even with a broken pipe, for such a concentration of gas to arise under ordinary domestic conditions as to cause accidental poisoning. In the United States carburetted water-gas, containing about 30 per cent of CO, is in common use, and accidental gas poisoning is more frequent than in this country. In some English towns as much as 15 per cent of CO may be present in the gas as against the normal 7 per cent. The second most important cause of CO poisoning is the gas-mixture which escapes from the exhausts of petrol-driven motor vehicles. This contains some 7 per cent of CO. The exhaust gases are hot and tend to rise at first. When cooled they are of nearly the same specific gravity as air, and mix easily with the air of any closed space, such as a garage. Cases of poisoning have also occurred in which the exhaust gas has got into a car owing to a leaky exhaust pipe, or even to a following wind. The large amount of CO discharged into the air raises a formidable problem in connection with the ventilation of tunnels taking motor traffic.

Producer gas and its variants, as used for gas engines or for firing boilers, may contain as much as 30 per cent of CO, and occasionally cause death. In the burning of smokeless fuels, the combustion is liable to become imperfect, and unless proper flues are provided, CO poisoning is a distinct danger.

Haldane emphasizes the dangers which may arise in treating CO poisoning by inhalations of pure oxygen. The patient will be suffering not only from oxygen deprivation but from CO<sub>2</sub> deprivation. The administration of pure oxygen, whilst effective in displacing CO, may be followed by cessation of breathing and slowing of the circulation. The best result is obtained by using a mixture of **Oxygen** with at least 5 per cent of **Carbon Dioxide**. Not only does CO<sub>2</sub> promote immediate recovery by stimulating respiration, but it is also said to prevent the subsequent occurrence of pneumonia. The tendency to pneumonia is probably due to injury to the lung and resultant liability to infection, in consequence of its very alkaline state during the excessive breathing caused by the poisoning.

M. R. Mayers<sup>2</sup> stresses the existence of a train of symptoms ascribable to chronic, as opposed to acute, carbon monoxide poisoning. She describes the condition of fifty garage workers exposed to air containing from 2.3 to 11.0 parts of carbon monoxide per ten thousand. Only 8 per cent were free from symptoms. The majority complained of headaches, dizziness, and burning of the eyes. The blood-haemoglobin was rather above normal. A considerable number showed pallor, which was not associated with any anaemia but was possibly due to vasoconstriction of the superficial capillary circulation, somewhat analogous to that found in lead poisoning. It is recommended that gas masks for use by those compelled to breathe atmospheres containing carbon monoxide should contain **Hopcalite**, a mixture of manganese dioxide and copper oxide. This serves as a catalyst, converting the carbon monoxide into carbon dioxide. In America the carbon monoxide content of the exhaust gas from motors is generally higher than in England, owing to the different methods of fixing carburettors.

F. Naville and C. Soutter<sup>3</sup> report four deaths from carbon monoxide poisoning from the gas-heating of clothes-boilers. They explain the occurrence as follows: Illuminating gas is a mixture of hydrogen, hydrocarbons, and carbon monoxide. The two former will burn at a lower temperature than the latter. In the case of a clothes-boiler filled with water the flame may be spread over a cold surface and unduly cooled. Under such circumstances unburnt carbon

monoxide may become released, whilst the hydrogen and hydrocarbons are burnt. Similar cases have been reported in Great Britain where hot-water geysers have been used without flues.

As regards **Artificial Respiration**, D. A. Coles,<sup>4</sup> the Medical Officer to the Gas Light and Coke Co., gives the following advice. If the sufferer is lying on his face, employ Schäfer's method, which is, generally speaking, the best method of artificial respiration. If the patient is lying on his back, and an assistant is present to hold the tongue out, do not waste time in turning him over if there is any difficulty in doing so, but perform artificial respiration by Sylvester's method. As a rule attempts at resuscitation are abandoned too soon. They should be continued for several hours, changing the operator as he gets exhausted. Artificial respiration should not be started if the patient is breathing moderately well, as it will retard rather than help his respiration; nor should it be continued after his breathing is established. On the other hand, artificial respiration should not be abandoned because the patient appears to be dead. If he is not, this lack of perseverance may kill him. Coles has found the hypodermic injection of **Oxygen** in large quantities over the limbs, buttocks, back, and abdomen, producing extensive emphysema of the skin, to be efficacious and safe. An advantage is that it can be carried out rapidly at the same time as all other measures are being adopted. The oxygen thus injected subcutaneously is rapidly absorbed and leaves no ill effects. It must be remembered, however, that the amount of oxygen absorbed this way is small compared to that which can be taken in by the normal route—the lungs.

REFERENCES.—<sup>1</sup>*Clinical Jour.* 1930, Dec. 31, 625; <sup>2</sup>*CO Poisoning in Industry*, Bulletin, Dept. of Lab., St. of New York, 1930; <sup>3</sup>*Rev. méd. de la Suisse Rom.* 1930, 336; <sup>4</sup>*Lancet*, 1930, ii, 1413.

## CARBUNCLE.

*Sir W. I. de C. Wheeler, F.R.C.S.I.*

In about 6 to 10 per cent of cases of carbuncle, sugar is found in the urine, but only about one-third of these cases are true diabetics. Treatment by the old-fashioned deep **Crucial Incisions** under gas-oxygen anaesthesia is probably as effective as any other method. After incision, **Hydrogen Peroxide** is poured over the wounds and a dressing of 10 per cent **Glycerin and Ichthyol**, or of 20 per cent **Magnesium Sulphate**, is applied and frequently changed. When the dressings are removed it is a useful plan to apply a **Bier's Cupping Glass** over the carbuncle, or use one of the more common rubber suction cups. Suction for a minute or two removes a considerable amount of pus and débris.

It is well perhaps to recall A. E. Morrison's method of treating carbuncle.<sup>1</sup> He recommends the application of a paste consisting of 1½ lb. of dried magnesium sulphate mixed with 10 oz. of glycerin acid carbolic or pure glycerin. The glycerin is put in a hot mortar and the sulphate added, slowly stirring and mixing with a warm pestle all the time. The result is a thick white cream, so hygroscopic that if exposed to the air it rapidly absorbs moisture and becomes fluid. It must therefore be preserved in a covered jar. The paste is spread thickly on a piece of sterile white lint, large enough to cover the whole of the inflamed area. A piece of jaconet is put over the lint, and cotton-wool in abundance. A profuse discharge of serum takes place, and the dressing is left unchanged for twelve to twenty-four hours. Within a few days the central slough separates and a raw granulating surface is left. The paste is continued until a healthy granulating surface is seen. Subsequently, the cavity is packed daily with strips of sterile lint about 1½ in. wide, wrung loosely out of a saturated solution of magnesium sulphate made by dissolving 40 oz. in 30 oz. of boiling water and 10 oz. of glycerin. The advantages of this method of treatment are: (1) No surgical interference is

required; (2) The combined osmotic action and its inhibitory effect on the growth of the staphylococcus cleanse the wound and assist in the separation of the slough.

Local auto-injection of **Whole Blood** sometimes is successful in cutting short the progress of a carbuncle. Under gas-oxygen anaesthesia 20 c.c. of blood are withdrawn from the basilic vein into a syringe containing about 2 c.c. of sodium citrate (2 per cent). This is injected round the periphery of the carbuncle at various points (Fig. 15). The needle is pushed deeper and deeper, commencing the injection under the skin and terminating in the deep necrotic tissue. The needle should be changed for each insertion.

R. U. Light and M. C. Sosman<sup>2</sup> conclude from a study of 50 cases treated with **X Rays** that when benefit occurred it lay usually in a hastened necrosis of the lesion, a softening or liquefaction of the carbuncle in the indurated stage. In a few instances the spreading tendencies of the lesions were checked, and healing occurred by drying up and absorption without any extensive drainage of necrotic products. X-ray therapy was occasionally employed with success following surgical procedures which failed to halt the spread of the carbuncle, and in these the activity of the infectious process was diminished and the peripheral spread halted. Relief of pain occurred in some instances of cervical carbuncles and, quite strikingly, in most of those of the face. Of the entire series, 34 cases were observed to have been improved by X-ray therapy, and 16 to have received no benefit from this treatment. Of those occurring in women, 13 out of 15 were improved; in men, where the site of predilection was the neck, three-fifths were helped by radiation. Eight of the 9 carbuncles of the face responded excellently, as did most of those of the extremities. The proportionate success of X-ray therapy diminished somewhat with the increasing size of the lesion; 75 per cent of those under 5 cm. diameter were benefited, whereas but 60 per cent of those larger than 9 cm. in diameter improved.

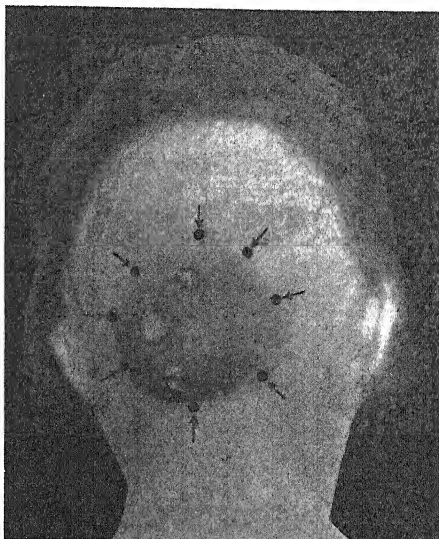


Fig. 15.—This carbuncle was treated by the auto-injection of blood at the points indicated: 45 c.c. of blood were injected. A scalpel was then taken and the various openings joined up. Within a week there was a clean, granulating surface which healed permanently. (By kind permission from Hamilton Bailey's 'Emergency Surgery'.)

REFERENCES.—<sup>1</sup>*Brit. Med. Jour.* 1924, i, 703; <sup>2</sup>*New Eng. Jour. Med.* 1930, Sept. 18, 549.

## CARDIOSPASM.

Robert Hutchison, M.D., F.R.C.P.

A. F. Hurst<sup>1</sup> reiterates his well-known view that this condition is not due to spasm of the sphincter but to failure of it to relax, and is therefore better spoken of as 'achalasia of the cardia'. The breakdown of the nervous mechanism of relaxation he attributes to inflammatory and degenerative changes

(of unknown origin) in Auerbach's plexus. Such changes have now been found in eleven cases. The disorder is equally common in the two sexes and may begin at any age.

**TREATMENT.**—As it is impossible to restore the power of relaxation to the cardiac sphincter, the object of treatment is to **Dilate** it to such an extent that it no longer offers any obstacle to the passage of food into the stomach. This is best done by rubber tubes (gauge Nos. 28 to 34), each containing 1 lb. 5 oz. of mercury. It is best to pass the first bougie during an X-ray examination, when its course can be followed. A mark should be made on the bougie at the level of the teeth when its lower two inches are in the stomach. Successively larger tubes are passed at a single sitting and the patient is finally taught to pass the largest one himself before each meal. The frequency of passage can soon be reduced, and finally may be discontinued entirely in favourable cases. In the very rare cases in which the mercury tube fails to give relief, operation becomes necessary either by digital stretching through the opened stomach or by longitudinal incision through the muscular wall of the abdominal œsophagus, a method comparable to Rammstedt's operation for congenital pyloric stenosis.

**Treatment of the Œsophagitis.**—The excessive secretion of mucus resulting from the œsophagitis, which is always present in chronic cases, leads to the retention of particles of food between the swollen rugæ of the mucous membrane. It is therefore necessary to give the patient a **Diet** containing no pips, skins, or vegetable fragments, which would be likely to act as irritants. He should chew his food thoroughly, eat slowly, and finish each meal by drinking half a pint of water or milk in order to wash the last traces of food into his stomach. During the first week of treatment it is advisable to give nothing but four feeds a day, each consisting of one pint of milk, which may contain glucose or a beaten-up egg; this is generally quite sufficient to cause a gain in weight of 2 or 3 lb. in an emaciated patient. Many learn to eject the contents of their dilated œsophagus voluntarily. Any one who can do this should be encouraged to evacuate the œsophagus half an hour after each meal, and then drink half a pint of water and evacuate at once as much of it as possible. As a rule a small quantity of food and a good deal of mucus are still present during the first few days of treatment, but the quantity of each gradually gets less. When there is no longer any residue to evacuate and no water can be returned, the œsophagitis as well as the achalasia of the cardia can be considered to be cured. In very long-standing cases with severe œsophagitis, if the patient is unable to evacuate his œsophagus voluntarily, it should be emptied and washed out with a rubber tube attached to a Senoran's evacuator half an hour after each meal, until all signs of œsophagitis and œsophageal retention have disappeared.

REFERENCE.—<sup>1</sup>*Quart. Jour. of Med.* 1930, July, 491.

### CAROTINÆMIA.

*Stanley Davidson, M.D., F.R.C.P.E.*

The lipochrome pigments carotin and xanthophyll, when taken into the human body in abnormal amounts, may cause a peculiar yellow discoloration of the skin. Three cases of carotinæmia in women are described by H. E. Miller,<sup>1</sup> and the literature and histopathology are reviewed. The condition is more frequently seen in diabetic patients than in non-diabetic individuals, probably as a result of the excessive vegetable diet taken; and some observers suggest that its presence in a diabetic subject is of unfavourable prognosis. Generally, carotinæmia is of little clinical significance. The diagnosis depends on a peculiar yellow colour of the skin, a diet rich in vegetables, and an orange-coloured pigment in the blood serum which is dissolved by petroleum ether.

REFERENCE.—<sup>1</sup>*Calif. and Western Med.* 1930, Sept., 662.

**CEREBROSPINAL FEVER.***J. D. Rolleston, M.D., F.R.C.P.*

**EPIDEMIOLOGY.**—According to official statistics<sup>1</sup> the number of cases of cerebrospinal fever reported by 60 different countries fell from 17,180 during the period July 1, 1928, to July 1, 1929, to 16,665 during the period July 1, 1929, to June 30, 1930, but at the same time the number increased in 14 countries, and very markedly in some of them, viz., Lithuania, Algeria, the Sudan, Mexico, and Japan. None of the countries, however, where the disease showed a recrudescence had any relation, geographical or otherwise, with any other country where there had been a recrudescence.

R. J. Peters and W. C. Gunn<sup>2</sup> describe an epidemic occurring in Glasgow during the first six months of 1929; this is the third which has taken place there during the present century. The first was in 1906-8, when 1363 cases were reported and the case-mortality in hospital patients was 74.8 per cent. The second outbreak was in 1915-16, when similar epidemics were occurring in most of the populous parts of Britain, and was associated with outbreaks in military centres, the primary factors in the spread of the disease being overcrowding, poor ventilation, fatigue, and exposure. The same factors were at work in the epidemic of 1929, when the fatality-rate among 134 cases was 83.5 per cent, or about 10 per cent higher than that of the first epidemic.

H. E. Whittingham, J. M. Kilpatrick, and E. W. B. Griffiths<sup>3</sup> record an epidemic of cerebrospinal fever which formed part of an epidemic widely spread over England, and occurred in the Royal Air Force in January and February, 1931, at Uxbridge, where it was confined to newly-joined recruits aged between 18 and 23½ years. It was apparently precipitated by local overcrowding in canteen, cinema, and around barrack-room fires.

**SYMPTOMS AND COMPLICATIONS.**—V. Cantalamessa<sup>4</sup> records 42 cases of cerebrospinal fever *in the first 12 months of life*. In 22 the first symptoms consisted merely in irregular fever, restlessness, and vomiting, with frequent loose stools, while in some there was only a slight constitutional disturbance. In 20 cases, however, the onset was sudden, with high fever and severe constitutional disturbance as in older children and in adults. This sudden onset was almost confined to cases which ran a rapid and particularly severe course. A distinctly intermittent fever was specially noted in cases which had a favourable though prolonged course. A moderate degree of splenomegaly was fairly frequent.

J. D. A. Gray<sup>5</sup> records a case complicated by *necrosis of the right kidney* in a male infant aged 5 months. There was no clinical abnormality referable to the urinary system except albuminuria probably due to toxæmia two days before death. No occlusion of the renal artery was found.

L. I. M. Castleden<sup>6</sup> reports a fatal case in a male infant, aged 1 year, complicated by an extensive *hemorrhage* in the right cerebral hemisphere following thrombosis.

A. H. Masters,<sup>7</sup> who records 3 illustrative cases, states that though many writers regard *endocarditis* as a rare complication of meningococcal infection, it may be present without any clinical evidence. All his patients recovered, the diagnosis of endocarditis being based on clinical evidence, the teleoröntgenogram, and electrocardiogram.

**DIAGNOSIS.**—A. Duryea<sup>8</sup> found that after intrathecal injection by cisternal or lumbar puncture of antimeningococcus serum into two normal persons exposed to cerebrospinal fever the response of the cerebrospinal fluid differed only from that of cases of cerebrospinal fever in the continued presence of sugar in normal or greater than normal amounts, and in the absence of bacteria. In both cases headache, vomiting, and rise of temperature occurred, but no nervous sequelæ developed.

S. McLean<sup>9</sup> emphasizes the diagnostic value of smears taken from purpuric

lesions in cases of endemic purpuric meningococæmia, as he has found meningococci in 12 out of 17 such cases in children aged from 46 days to 7 years.

**PROPHYLAXIS.**—Whittingham, Kilpatrick, and Griffiths<sup>3</sup> recommend **Nasopharyngeal Disinfection** by means of simple douching and gargling, especially by those who come in contact with the sick and by carriers, and advise that it should be persisted in for a fortnight after exposure to infection.

Active immunization on a large scale carried out by K. Zrunek and B. Feierabend<sup>10</sup> in the Czechoslovak army with a **Vaccine** containing 4,000,000,000 meningococci per cubic centimetre proved ineffective, the incidence of the disease being little less among the inoculated than among the controls.

**TREATMENT.**—H. S. Banks,<sup>11</sup> who records two illustrative cases in patients aged 11 and 18, suggests that when it is impossible to determine the type of infecting meningococcus and to apply the specific univalent serum, the available **Multivalent Serum** should be injected in doses of 100 to 200 c.c., preferably intravenously, or if that is impossible, intraperitoneally, in addition to the usual treatment.

T. Goldman and A. G. Bowen<sup>12</sup> report their observations on 50 cases in which antimeningococcus serum was given by **Cisternal Puncture**. Each case received an average of 6.4 punctures, or two less punctures than by the lumbar route. An average amount of 135 c.c. of serum was injected into the cisterna and 128 c.c. were given either intravenously or intraperitoneally. Of the 50 cases 18, or 36 per cent, died, a difference of 22 per cent in favour of the cisternal over the lumbar route.

Whittingham, Kilpatrick, and Griffiths<sup>3</sup> state that the aim should be to reduce the increased intrathecal pressure to normal limits, to replace as far as practicable the purulent cerebrospinal fluid by a bland fluid, and to ensure the uniform distribution of antiserum throughout the subarachnoid space; 60 c.c., therefore, of cerebrospinal fluid should be withdrawn, the subarachnoid space irrigated with 100 to 200 c.c. of saline, and up to 30 c.c. of antimeningococcal serum injected once or twice daily until at least three days after meningococci have disappeared from the cerebrospinal fluid.

**REFERENCES.**—<sup>1</sup>*Monthly Epidem. Rep. Health Sect. League of Nat.* 1930, 334; <sup>2</sup>*Jour. of Hygiene*, 1930, xxx, 420; <sup>3</sup>*Brit. Med. Jour.* 1931, i, 1101; <sup>4</sup>*Pediatrics*, 1931, 234; <sup>5</sup>*Lancet*, 1931, i, 863; <sup>6</sup>*Ibid.*, 917; <sup>7</sup>*Jour. Amer. Med. Assoc.* 1931, xevi, 164; <sup>8</sup>*Ibid.* 1930, xev, 1582; <sup>9</sup>*N. Y. State Jour. of Med.* 1931, xxxi, 684; <sup>10</sup>*Trav. Inst. d'Hyg. Pub. Etat Tchecoslov.* 1931, 1; <sup>11</sup>*Lancet*, 1931, i, 747; <sup>12</sup>*Amer. Jour. Med. Sci.* 1930, clxxxi, 414.

## CHANCROID.

Col. L. W. Harrison, D.S.O.

**DIAGNOSIS.**—P. Ravaut, Rabeau and D. Hesse<sup>1</sup> report a case in which the nature of an indolent *inguinal bubo* was decided by intradermal inoculation of its contents. The bubo had been in existence for eleven weeks and the original sore had long since healed. A week after aspiration of the gland the bubo softened and was incised. The contents were inoculated into different parts by scarification, but these failed to produce a lesion. Intradermal inoculation of the arm which was practised simultaneously, however, produced typical chancroids from which Ducrey's bacillus was recovered. In a later communication<sup>2</sup> these authors describe results in a number of clinically doubtful cases (30 males and 3 females) in which different methods of diagnostic inoculation were practised. The lesions tested were 46, including ulcers and buboes, and the results were controlled by examination for Ducrey's bacillus 46 times, simultaneous scarification of the skin of other parts 45 times, and intradermal inoculation with Dmlecos 40 times. The cases were divided into four groups as follows: (1) With chancroidal lesions in the ano-genital region (13 men, 1 woman); 12 of these had buboes. (2) With inguinal buboes and genital lesions

(15 men and 1 woman). (3) With inguinal buboes but no genital lesion (8 men and 1 woman). (4) With inguinal buboes but no history of preceding sore. The material for inoculation was obtained by scraping the lesions, or by aspiration in the case of closed buboes, and was used pure, or diluted with an equal part of water. For an intradermal inoculation the dose was from 3 to 6 divisions of a Barthélemy syringe. In a typically positive reaction a red papule formed, and at the end of forty-eight hours it showed a small pustule which enlarged in the course of three days, necrosed in the centre, and broke down to a chancreoid ulcer. Ducrey's bacillus might be recovered by the second or third day. In some cases the lesions formed more slowly and disappeared in about ten days, while in others a necrotic spot formed in the centre, after which the lesion cicatrized. *Table I*, constructed from the author's text, shows the results.

*Table I.*—RESULTS OF VARIOUS DIAGNOSTIC METHODS IN CHANCROID.

GROUP	DUCREY'S BACILLUS PRESENT	SCARIFICATION WITH MATERIAL FROM LESIONS	INTRADERMAL INOCULATION	
			Dmelcos	Material from Lesions
(1)				
14 lesions	Positive	2	10	9
	Negative	12	2	5
	Doubtful	—	1	—
	Not done	—	1	—
(2)				
16 lesions	Positive	0	9	6
	Negative	15	2	2
	Doubtful	—	1	8
	Not done	1	4	—
(3)				
9 lesions	Positive	0	5	2
	Negative	9	1	1
	Doubtful	—	3	6
	Not done	—	—	—
(4)				
7 lesions	Positive	0	2	1
	Negative	7	3	6
	Doubtful	—	1	—
	Not done	—	1	—

In the case of intradermal inoculation with live material only those cases in which the bacillus of Ducrey was recovered from the re-inoculation lesion were looked upon as being positive. The method gave eight fewer positives than did inoculation with Dmelcos, but the authors say that a positive with Dmelcos may possibly be the result of previous infection, and also it does not afford the confirmation of finding Ducrey's bacillus in the lesion of re-inoculation. In certain of the doubtful and even the negative cases the chancreoid (Ducrey) nature of the original lesion was proved by recovery of the bacillus by other means. The authors suggest that the method of intradermal inoculation with living material from doubtful lesions might be used in both animal and man in the diagnosis of other affections. [It may be useful here to record that the intravenous injection of Dmelcos (see MEDICAL ANNUAL, 1926, p. 85, and 1927, p. 84) is a valuable method of treatment of chancreoid lesions. The dose is 1 to 1.5 c.c. three times a week.—L. W. H.]

**Granuloma Inguinale.**—F. S. Patch and C. L. Blew<sup>3</sup> report four cases of granuloma inguinale seen in Montreal. Two were negroes and two whites, and in three cases the infection was contracted in the Tropics, while the fourth, a negro, had never been out of Canada. Donovan bodies, believed to be the causal agent, were found in two of the cases. Treatment was by 10 to 24 intravenous injections of **Antimony Thioglycollamide**, 10 to 20 c.c. of a 0.4 per cent solution every third day, and local applications of **Bismuth Formic Iodide** and **Iodoform**. Other methods of treatment mentioned by the authors, who give a review of the literature, are intravenous injections of 5 to 12 c.c. of a 1 per cent solution of **Tartar Emetic** and of **Antimony Sodium Thioglycollate**.

REFERENCES.—<sup>1</sup>*Bull. Soc. franç. Dermatol. et Syph.*, 1930, June, 700; <sup>2</sup>*Presse méd.*, 1930, Oct. 15, 1393; <sup>3</sup>*Canad. Med. Jour.* 1930, Nov., 637.

### CHEMOTHERAPY OF CANCER.

*Stanford Cade, F.R.C.S.*

Chemotherapeutic measures in the treatment of cancer present a fascination which has attracted many workers; the results, however, are not encouraging, and beyond the interest of a few specially selected successful cases, the treatments by chemical agents seem to have added very little to the armamentarium in the fight against cancer.

**Mustard Gas (Dichlorethylsulphide).**—F. E. Adair and H. J. Bagg,<sup>1</sup> from the Memorial Hospital, New York, report the results of an investigation of the effects of mustard gas on squamous-celled carcinoma. The method as described consists in the local application of  $\frac{1}{4}$  min. of a solution of mustard gas in alcohol. The reaction obtained is very violent and leads to the destruction of the tissues, followed by healing. Injections of the solution into a neurogenic sarcoma led to its disappearance in one case. The authors believe that mustard-gas solution offers an agent for fighting cancer providing the lesion is localized. The method as described requires the greatest caution in handling the concentrated gas, as accidents both to doctor and patient must at all costs be avoided. The local reaction obtained has nothing specific, all tissue being equally destroyed, and similar results may be anticipated from other chemical substances. That the destruction produced by the gas is followed by healing is more remarkable, but so far the time elapsed since the initiation of the experiments is too short to judge the chances of local recurrence. It is a method which so far does not lend itself to extensive lesions or internal neoplasms. It can be carried out only in specialized institutions, is not devoid of risk, and presents no advantages over radiation.

**Radio-active Bismuth.**—H. Kahn<sup>2</sup> states that chemical analysis of tumours and viscera previously treated with heavy metals shows that bismuth is the only substance which deposits selectively in the tumour cells. Further, with bismuth therapeutic effects can be obtained with non-toxic doses, whereas with most heavy metals toxic symptoms develop before a clinical effect is reached. It was found that the bismuth isotope radium E was the only radio-active substance which influenced the tumour cell without injury to normal tissue. The radio-active bismuth is eliminated mainly by the kidneys, it has little affinity for the reticulo-endothelial system. It is claimed by Kahn that in cancer patients in whom the bismuth radium E was employed, marked changes in the tumours were noted. Further investigation is necessary before the use of this metal can be recommended as an additional measure in the treatment of cancer.

**Colloidal Metals.**—The medical treatment of cancer is outlined by A. T. Todd<sup>3</sup> with a fairness which commends itself to all who are interested in the problem. He admits that there is no medical system of treatment which will



ensure regression of malignant growths in a high percentage of cases, but it is pointed out that medicinal treatment may still be of real value if applied in association with the orthodox surgical or radiological procedures. The lines of treatment as advocated by Todd can be summarized as follows: (1) Radiation treatment should take precedence of medicinal treatment and should be as thorough as possible. (2) In inoperable cancer as much as possible should be removed by surgical means. In cases with hepatic or other visceral metastasis, it is still considered advisable to remove the primary growth if practicable, as the metastases require less colloid than the primary lesion. (3) Medicinal treatment is specially recommended as a post-operative measure.

The treatment itself is of a complex nature and consists of: (1) **Lead Selenide** given intravenously, to increase local and general defence mechanisms; (2) **Calcium Chloride** to increase ionized calcium by acidosis, to correct alkalosis, and to furnish a depôt for calcium assimilation; (3) **Fat-soluble Vitamins** in large doses, especially vitamin D, to increase calcium absorption; (4) Small doses of **Thyroid Extract** as a tonic and anti-infective agent; (5) **Liver Extract** to combat anemia.

The treatment, although complex, is based upon a sound study of the effects of malignant disease upon the general state of health and upon scientific investigation both in the laboratory and in the wards. It falls short of a specific remedy, but as no extravagant claims are made and the treatment can be carried out by the majority of medical practitioners, it offers something to those who are beyond surgical or radiological help.

N. Alpert,<sup>4</sup> in a study of the effect of colloidal methods on the growth of malignant tumours, points out the importance of determining the condition of the blood before starting treatment. If the white count is found to be below 8000, with a relative low percentage of neutrophils and relatively high small-lymphocyte count, attempts at correction should precede treatment; injections of colloidal **Gold** are said to be effective, one or two injections of 5 c.c. being all that is required. An alternative is sterile **Milk**, 5 to 10 c.c. being given intramuscularly. In no case of marked leucopenia should treatment with metals be undertaken. The metals employed are **Copper, Selenium, Lead, Platinum, and Gold**. It is stated that the selection of the metal suitable for any individual case depends upon the reaction to the treatment as shown by the resulting leucocytosis. The methods described are crude, and beyond one apparent success in a case of rectal growth, not proved histologically, no benefit seems to be derived from it.

**Pituitary.**—Wm. Susman<sup>5</sup> has studied the effect of the pituitary on the progress of malignant growth, both experimentally and clinically. The hypothesis on which the work is based is that the pituitary is the seat of the growth-producing hormone and of a growth-checking hormone. Examination of the pituitary in a series of cancer cases suggested that the anterior pituitary was over-active and was stimulating growth, and that the lesions in the posterior pituitary probably affected the quality and quantity of the posterior secretion, and by so doing the growth-restraining influence was inadequate. It was also thought that the genital glands had a restraining influence on the anterior pituitary and that the administration of ovarian extract might control the overactivity of the anterior pituitary in malignant disease. The treatment consists therefore of: (1) **Pituitrin** to reinforce the secretion of the posterior pituitary; (2) **Ovarian Extract** (Theelin) to restrain the over-activity of the anterior pituitary; and (3) A low carbohydrate **Diet** to starve the growth. Clinical evidence of the beneficial effect of the treatment is shown in seven cases treated. The effects, however, have not so far been repeated by independent observers, or in the writer's hands. The criticism of the hypothesis

is that 'growth' of tissue which is a normal process and of necessity under the control and influence of the endocrine system, is compared to neoplastic formation, where the term 'growth' is not applicable in the same sense. The actual development and progress of a neoplasm, although showing evidence of increase in size and mitotic division, may have little in common with normal growth and need not necessarily be under the influence of hormones. The same criticism applies to the 'growth-restraining hormones' of the parathyroid; the latter has so far proved quite ineffective in checking the progress of cancerous lesions.

REFERENCES.—<sup>1</sup>*Ann. of Surg.* 1931, Jan., 190; <sup>2</sup>*Deut. med. Woch.* 1930, lvi, 2119; <sup>3</sup>*Lancet*, 1930, ii, 389; <sup>4</sup>*Med. Jour. and Record*, 1930, Sept. 17, 296; <sup>5</sup>*Brit. Med. Jour.* 1931, Oct. 31.

### CHICKEN-POX.

J. D. Rolleston, M.D., F.R.C.P.

**SYMPTOMS AND COMPLICATIONS.**—W. Schwenk<sup>1</sup> illustrates the effect of varicella on the course of tuberculosis by his observations on 87 cases of varicella which have occurred in a children's sanatorium during the last five years. He came to the conclusion that varicella might sometimes cause an activation of dormant tuberculosis, and that the children who ran the greatest risk were: (1) Those under six years of age; (2) Those whose attack of varicella had been severe; and (3) Those who had been suffering from a specially severe form of tuberculosis, such as Pott's disease.

In illustration of the relations between herpes zoster and varicella R. R. McCormick<sup>2</sup> records four cases of herpes zoster occurring among persons in contact with one another during an epidemic of varicella. In one case, a man aged 23, a generalized vesicular eruption closely resembling varicella and involving the skin of the entire body and the mucous membranes developed on the twelfth day of herpes zoster. Death took place on the tenth day of disease from general sepsis. No cases of varicella resulted from contact with this case during the period of generalized eruption. Post-mortem examination showed severe inflammatory and gangrenous lesions in all the layers of the skin, and a posterior poliomyelitis involving the posterior root ganglia, which were very friable and hæmorrhagic, and the posterior half of the spinal cord.

Laignel-Lavastine, A. Miget, and S. Constantinescu<sup>3</sup> report the case of a male, aged 18, who in convalescence from an apparently mild attack of varicella developed symptoms of meningitis and died in 5 days. Post-mortem examination of the brain and meninges confirmed the diagnosis of meningitis with a cortical reaction. Tuberculous meningitis was excluded by the negative results of bacteriological examination and inoculation of guinea-pigs. Although meningeal reactions are not infrequent in varicella, this is the first case on record in which meningitis in convalescence from varicella has proved fatal.

REFERENCES.—<sup>1</sup>*Zeits. f. Kinderheilk.* 1930, xlix, 686; <sup>2</sup>*Jour. Amer. Med. Assoc.* 1931, xevi, 766; <sup>3</sup>*Bull. Soc. méd. Hôp. de Paris*, 1930, 1448.

### CHILBLAINS.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

R. Hallam,<sup>1</sup> in a very interesting paper, discusses the etiology of chilblains. He finds that among 1000 patients chosen from casualty, medical, and tuberculous patients, the percentage incidence is 5.3, 9.2, and 13.2. He does not agree with certain French writers, who consider the chilblain a tuberculide, but thinks that tuberculosis and certain other diseases which impair the general health are predisposing causes. He found that none of his patients suffering from arteriosclerosis had chilblains, while on the other hand patients with some form of heart disease gave a history of recent chilblains in 17.4 per cent. These observations tend to show that gross defect in the arterial wall may exist without materially diminishing the vitality of the capillary, while

the lessened propulsive force of the heart may interfere in some way with the nutrition of the superficial vessels. As regards endocrine disturbance, none of his cases of myxodema had chilblains, while 3 out of 24 cases of hyperthyroidism had developed chilblains since the onset of the disease. From his observations it appears that the cyanosis and colour is accounted for by a constriction of the arterioles, together with a dilatation of the capillaries and subpapillary venous plexus. The walls of the smaller vessels show some thickening on histological examination. He therefore concludes that there must be an unknown and independent factor producing a change in the wall of the smaller cuticular vessels, in addition to the factor which causes slowing of the bloodstream. This change in the vessels is necessary before cold is able to damage the tissues, for in normal skin, as Lewis has pointed out, even after the skin has been sufficiently frozen to form a wheal, the capillaries are afterwards found to be intact.

Hallam accepts Percival and Stewart's view that the serum calcium is normal in cases of chilblains and he also finds no change in the blood-coagulation time in his own cases. He further finds that children on an average diet show no higher incidence of chilblains than children having an added amount of vitamins A and D, while apparently healthy children who have had a generous diet over a long period containing more than a sufficiency of calcium, with additional amount of vitamins A and D, may acquire chilblains on exposure to cold. It has also been noted that the incidence of chilblains in a group of London elementary school children exposed to a carbon arc light during the winter was no less than in a control group.

TREATMENT.—F. H. Humphris<sup>2</sup> recommends the **Paraffin-wax Bath** for chilblains. The hands and feet are placed for twenty minutes in melted paraffin wax at a temperature of 120° to 130° F. Wax can be used at a much higher temperature than it would be possible to use water. As a subsidiary treatment **Ultra-violet Rays** are useful.

REFERENCES.—<sup>1</sup>*Brit. Med. Jour.* 1931, i, 215; <sup>2</sup>*Practitioner*, 1930, Oct., 531.

## CHILDHOOD, PSYCHOPATHOLOGY OF.

*Henry Devine, M.D., F.R.C.P.*

Though there are no precise or clear-cut methods for diminishing the considerable incidence of mental disorder in the community, it is now being increasingly felt that active concern with the behaviour disturbances of childhood may avert the development of serious maladjustments in later life. It certainly can be claimed that attention to the mental health of childhood is quite as important as that given to the physical health during the early years of life. The mental hygiene movement, indeed, as E. L. Richards<sup>1</sup> observes, aims to study the behaviouristic growth and development of a child in the same intelligent manner that preventive medicine is studying his nutrition and metabolism. The same writer points out that there are many common causes of delinquencies and nervousness in children, emphasizing particularly the following: (1) Discrepancy between the child's intellectual ability to grasp and correlate the demands of the home and school environment with what home and school expect of a child of his age is a common cause of childish misfitting. A child who is forced to follow a programme beyond his ability is bound to react with 'nerves', or truancy, or stealing, just as a foot shod with an ill-fitting shoe develops pathologic conditions of skin and joints. (2) A child suffering from physical conditions seriously affecting nutrition, locomotion, eyesight, hearing, or speech is recognized by all as behaviouristically handicapped, but here again are mental hygiene problems that involve something more than making allowances for the disability. There is a tendency

to progressive sensitiveness, the feeling of discouragement over tedious processes of treatment and inadequate opportunities for schooling, and always the increasing realization that he must be limited in what he can do for a livelihood and must be content to accept any remuneration for services that society sees fit to offer him. (3) A poor start in habit training during pre-school years is another frequent cause of so-called bad or nervous children, and the physician can do much to start the young mothers on the right way of managing the early years of a child's life. (4) Another source of individual childhood strain is to be found in unwholesome social and domestic conditions (economic strains, overcrowded living arrangements, broken homes, parental disharmonies, discrepancy between parental ambitions and child capacities). (5) The temperamental equipment of a child is a matter that well repays careful study, and the study of the nervous adult often reveals a great deal about childhood personalities that stand the strains of life poorly. Enuresis, night terrors, eczema, stammering, easy vomiting, and ties are childhood fore-runners of hay fever, bronchial asthma, mucous colitis, and angioneurotic oedema of adolescence and maturity. There are children who become fatigued easily and yet have abundance of energy, and their precociousness often leads their teachers and parents to overburden them with intellectual and physical activities.

Writing along similar lines J. E. Anderson<sup>2</sup> stresses the important position held by the pediatrician (and also, we feel, the general practitioner) in relation to the children under his care. The medical man, whether as the family doctor or specialist, sees them from time to time throughout the period of their most rapid growth; he is consulted by the parents both during emergencies and when emergencies do not exist. If he is interested in the whole adjustment of the child, he can do much in his incidental contacts with the children and with the family to further their well-being with respect not only to their physical health but also to their mental health.

In the Morison Lectures for 1931 D. K. Henderson<sup>3</sup> gives an interesting account of the existing machinery for dealing with the problem child. An important development is the growth of what are termed *habit* or *nursery clinics*. Such clinics cater for children up to the age of five years. During that period it is possible to distinguish between the normal child; those suffering from defect, whether due to diseased germ-plasm or to some more acquired state, e.g., birth injury, illness, deprivation of senses; and the unstable, psychopathic, delinquent types, who may show a high intelligence quotient, but suffer from disorders of conduct. The sooner guidance and training can be instituted the less chance there will be for the development of those nervous traits and habits which are sometimes so difficult to eradicate in adult life. Thom (quoted by Henderson), one of the pioneers in this work, states that "the object is to further the formation of habits that will lead towards the proper development of the child and its best interests, to determine the basis of unsuitable habits and methods of reaction, and to institute proper training and teaching."

A further stage has been the establishment of *child guidance clinics*. Originally these clinics were developed as adjuncts to juvenile courts, and dealt especially with delinquent children. Their scope has now been so widened as to emphasize the preventive aspects, and to redirect the energies of the maladjusted child before he becomes a problem. The ideal plan is to link these clinics closely with the educational system, and, to make them effective, there should be a team of workers comprised of a psychiatrist, psychologist, educationist, and social worker, co-operating with one another. The function of the clinic is not merely to detect mental disorder or defect which may be

considered a suitable explanation for the disordered behaviour, but its special importance is to determine all the factors which may have had some influence, and on this basis to formulate a well-considered plan of treatment. A person cannot be reconstituted, but he may be modified so as to effect a better social adaption. The directors of the Commonwealth Fund of New York City were so impressed by the possibilities of child guidance work that in 1927 an Institute for Child Guidance was inaugurated to develop the work further by establishing clinics and scholarships, and by providing a centre for the adequate training of psychiatrists, psychologists, and social workers. Owing to the beneficence of the Commonwealth organization a child guidance clinic has been established in London, and has received recognition from the London County Council, which means that: (1) Attendance at the clinic counts as school attendance; (2) The London County Council must be represented on the Administrative Board; (3) The Council School Medical Officers have the right to inspect the clinic; (4) The clinic undertakes to report to the School Medical Officer on every London County Council child treated.

It is evident that habit and child guidance clinics are able to deal with only a limited number of children exhibiting psychopathological traits. These clinics, indeed, only aim at dealing with the maladjusted 'normal' child, and the bulk of mental disorders of childhood will have to be dealt with either by clinics in connection with psychiatric hospitals, such as the Maudsley Hospital, or those in connection with the general hospitals. It must be emphasized that the abnormal child is definitely a medical problem. It is quite true that the parents, educationists, psychologists, and social workers have an important part to play in the development of the child, but, as Henderson observes, "the position which we as doctors maintain, is that no patient showing defect or abnormality of behaviour or lack of social adaption has been satisfactorily examined unless a complete medical and psychiatric examination has been made." In many cases the more purely psychological aspects may be in the foreground, in others the educational, but in every case there is a medical background which requires study and interpretation. Out-patient psychiatric clinics in connection with general hospitals are now increasing in number, and no doubt this tendency will be still more evident now that it is permissible under the provisions of the MENTAL TREATMENT ACT (q.v.) for Local Authorities to give financial support to these clinics. The organization and functions of such a clinic (for adults as well as children) have been recently admirably outlined by I. Skottowe.<sup>4</sup>

R. G. Gordon<sup>5</sup> gives an account of the clinic for children suffering from mental disorders which has been organized at Bath. The clinic is run on voluntary lines with the co-operation of the Medical Officer of Health, the School Medical Officers, and other officials, who give their services entirely voluntarily; and, in addition, the salary of a half-time social worker has been guaranteed by the generosity of a lady, this being practically the only expense. Once a month those specially concerned with the work meet and discuss the cases seen in the interval, hear reports of investigations carried out, and try to determine a course of procedure for the child. Once a quarter there is a committee meeting with a solicitor, a clergyman, and a representative of the Education Authority present, so as to enlist their co-operation in respect of school adjustments, social factors, placing the children in Girl Guide and Boy Scout troops, and so on.

Out of a series of 50 cases the following special conditions of the child have been discovered, the rest being more or less social maladjustments in which the home or the parent was more involved than the child himself: psychoneuroses, 3; glandular defect, 3; syphilis, 2; chorea, 4; moral defective, 2;

post-encephalitic, 2; epilepsy, 1. Some interesting facts are given in this paper by Gordon in regard to the careers of 100 children who were referred to the School Medical Officer during the last nine years on the supposition that they were mentally defective, but really in the majority of cases because they were a difficulty in school. Although most of these 100 children were below the 100 per cent intelligence quotient, as estimated by the Terman scale, none of them was certifiable under the Mental Deficiency Act; they continued their careers in the ordinary schools, and although 50 per cent showed somewhat serious maladjustments at school age, over 90 per cent made good later on. These data should be very encouraging to those who are interesting themselves in the difficult or abnormal child.

Writing on the psychopathology of childhood, R. D. Gillespie<sup>6</sup> points out that there are three cardinal points to be considered in the psychology of children, considered apart from the psychology of adults, so far as distinctions in this field can be drawn. They are, first, the great influence of environment upon the child's mental processes; secondly, the plasticity of the latter; and thirdly, the prominence of the egoistic tendencies, their frustration and substitution, in the production of symptoms. Environment means, of course, the personal environment of parents, brothers, sisters, teachers, and companions; and an important reflection occurs here, that when signs of morbidity appear, they arise at the surface of contact, so to speak, of the child's environment with his aims and desires, rather than at some locus of conflict deeply within the psyche. It is far more often a question of some direct frustration than of a conflict between an introjected ideal and libidinous unconscious wishes. This generalization is one of practical importance, as it connotes that relatively simple adjustments of the environment, after careful consideration of the tendencies whose frustration or misdirection are indicated by the symptoms, will cause the latter to disappear; and that intensive intrapsychic exploration of the child's mind is usually unnecessary. Hence the psychiatrist's method of exploring the problem principally through interviews with parents and other adults rather than with the child itself has its justification.

The effect of the plasticity of children is shown in the striking difference between the prognosis in children and adults. The statistical analysis of 70 adult patients who were treated at the out-patient department for nervous disease and psychological medicine in Guy's Hospital two years ago, and have subsequently been followed up, gives this result:—

Not traced .. .. .	7
Dead, committed suicide, or disappeared .. .. .	9
Condition little changed .. .. .	28
Improved .. .. .	14
Much improved or cured .. .. .	12
Total .. .. .	70

This gives a percentage of 37 improved or cured. A similar investigation among 60 children two years after their treatment gives the following figures:—

Not traced .. .. .	5
Condition little changed .. .. .	16
Improved .. .. .	15
Much improved .. .. .	24
Total .. .. .	60

This gives a percentage of 'improved' or 'well' of 65. Included in this group of cases were all varieties, even such unfavourable ones as feeble-minded and epileptic children.

The writer finds it convenient to classify the nervous and mental disorders of childhood under the following headings :—

1. *Disorders of Personality*.—Timidity, obstinacy, outbursts of temper, sensitiveness, shyness, day-dreaming, lack of sociability, emotional disturbances, etc. (Intelligence quotient in Guy's series 81 to 103.)

2. *Behaviour Disorders*.—Truancy, wandering, temper outbursts, lying, stealing, begging, cruelty, sex misdemeanours, food fads, refusal of food. (Age range 4 to 14. Intelligence quotient 67 to 103.)

3. *Habit Disorders*.—Nail-biting, thumb-sucking, incontinence—nocturnal and diurnal—constipation, vomiting, stammering, etc. (Age range up to 14. Intelligence quotient 77 to 127.)

4. *Psychoneuroses*.—Anxiety neuroses (age range from 7 to 14), hysteria (age range from 5 to 14, intelligence quotient 64 to 93), phobias, obsessions and compulsions, ties (some).

5. *Psychoses*.—With regard to this group the writer expresses the view that psychoses in the adult sense are so rare in childhood as to furnish relatively little material for investigation. When symptoms resembling those of an adult psychosis are observed, the writer feels that the term 'regression' is most suitably applied to them rather than such labels as schizophrenia.

6. *Epilepsy*.

7. *Mental Deficiency*.—Dull and backward group, the result of general or localized defect—for example, word-blindness and word deafness; feeble-mindedness; imbecility, idiocy; temperamental defect ('moral imbecility').

8. *Sleep Disorders*.—Insomnia, night terrors, somnambulism.

9. *Mental Disorders* occurring with, and probably dependent upon, some physical disease—for example, chorea, epidemic encephalitis, trauma.

10. *Disorder of the so-called 'Glycopenic' Variety*.—Migraine, crises of collapse, insomnia, night terrors, and vomiting.

REFERENCES.—<sup>1</sup>*Jour. Amer. Med. Assoc.* 1930, Oct. 4, 1011; <sup>2</sup>*Ibid.* 1015; <sup>3</sup>*Edin. Med. Jour.* 1931, May, 289, June, 359, July, 414; <sup>4</sup>*Jour. of Ment. Sci.* 1931, April, 311; <sup>5</sup>*Bristol Med.-Chir. Jour.* 1930, xlvii, 111; <sup>6</sup>*Brit. Med. Jour.* 1930, ii, 807.

**CHILDREN, MEDICAL DISEASES OF.** (See ACIDOSIS IN CHILDREN; ALLERGY IN CHILDREN; CELIAC DISEASE; INFANTILE DIARRHOEA, THE RÔLE OF AURAL INFECTION IN; OSTEOGENESIS IMPERFECTA; PINK DISEASE; PYURIA IN CHILDREN; RHEUMATIC INFECTION IN CHILDREN; THYMUS IN CHILDREN; TUBERCULOSIS IN CHILDREN.)

**CHILDREN, SURGICAL DISEASES OF.** (See BLADDER, ECTOPIA AND EXTROVERSION OF; EMPYEMA IN CHILDREN; HARE-LIP AND CLEFT PALATE; HERNIA OF THE OVARY AND FALLOPIAN TUBES; HIP, CONGENITAL DISLOCATION OF; HIRSCHSPRUNG'S DISEASE; HYDROCELE; INTUSSUSCEPTION; OSTEOMYELITIS; PERITONITIS, PNEUMOCOCCAL AND STREPTOCOCCAL; PHIMOSIS; TESTIS, UNDESCENDED; TORTICOLLIS, CONGENITAL; TUBERCULOSIS, SURGICAL; URETHRA, OBSTRUCTION OF.)

**CHILDREN, UROLOGICAL EXAMINATION OF.**

*John Fraser, Ch.M., F.R.C.S.Ed.*

It is increasingly recognized that most of the errors of the urogenital system which occur in adults may be encountered in childhood and in infancy. In addition there are a considerable number of congenital anomalies which are even commoner in the young. Despite this, the adoption of efficient methods of urological investigation in childhood has been long delayed. M. F. Campbell's<sup>1</sup> contribution, therefore, is timely and valuable. He briefly discusses

the indications that should suggest a urological investigation; in the light of his experience these are pyuria, derangement of the act of micturition, hæmaturia, palpable tumour, and renal pain or colic.

Pyuria provides the largest number of subjects, and Campbell found the explanation to be mainly lesions similar to those which cause genito-urinary suppuration in adults. In addition, the routine investigation of juvenile pyuria has resulted in the discovery of a hitherto undescribed obstructive lesion, 'trigonal curtain'.

Among the disturbances of micturition, enuresis is the most important, and the most difficult to treat with success. The author mentions that he has performed complete urological examination in 150 cases, and is struck by the frequency with which he finds organic urinary obstruction and varying degrees of renal infection.

We have Campbell's assurance that cystoscopic examination in childhood is attended with less post-instrumental morbidity than it is in adults. His plea for a more liberal attitude towards such investigation is therefore sound.

REFERENCE.—<sup>1</sup>*Med. Jour. and Record*, 1931, April 15, 392.

## CHOLERA.

*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

A forecast of the probable incidence of cholera in India during 1931 was recorded in February, 1931 by Sir L. Rogers,<sup>1</sup> together with the results of his forecast of the previous year, which proved to be accurate to a surprising degree, especially as regards the epidemic which resulted from the Allahabad Kumbh fair of 1930, which affected Bihar more severely than it had done for a number of years past, and also to a less extent the neighbouring eastern districts of the United Provinces, which were apparently saved from a more severe outbreak by low spring absolute humidity in accordance with the writer's prognostication.

The *non-protein nitrogen content of the blood* in 66 cases of cholera has been investigated by D. R. Dhar and P. C. Adhyee,<sup>2</sup> who found a high reading to be associated with fatal post-choleraic uræmia, but a low content to be of good prognostic significance. The importance of early treatment to prevent dangerous renal stasis is emphasized.

The *epidemiology* of cholera in the Punjab is dealt with by C. A. Gill and R. B. Lal<sup>3</sup>, who find that between 1924 and 1929 only a small proportion of the outbreaks were of the explosive type due to contaminated water, and the more slowly spreading outbreaks are associated with bad conservancy, and consequently they think are fly-borne. Preliminary bacteriological examination of bred flies fed on cholera-infected food showed infection of their gut up to five days; the writers therefore consider the flies to be biological carriers of cholera. M. H. Finkelstein<sup>4</sup> discusses the literature of the bacteriology of cholera, and urges co-ordinated international investigation of the problem.

PROPHYLAXIS.—The keeping powers of cholera **Vaccines** have been tested by V. G. Raju,<sup>5</sup> who found that in carbolized vaccines at room temperature progressive autolysis reduced the opacity considerably in even twenty-four hours, but it is greatly retarded by placing it in a refrigerator at 32° F. Standardization by the opacity should therefore be carried out immediately after the preparation of such vaccines. The results of cholera vaccine in Bengal during an outbreak in a pilgrim centre without a piped water-supply are reported on by B. L. Sircar.<sup>6</sup> Among 500 inoculated contacts in infected houses, only 3 were subsequently attacked, within three, twenty-four, and seventy-two hours of the inoculation—that is, before it had time to take effect—and 3 of 60 uninoculated contacts were attacked. There was no evidence of any negative phase after inoculation. The benefit of the measure is seen from the fact that



in 45 out of 46 infected houses no cases occurred after inoculation of the contacts, although Maitra, of the Calcutta School of Tropical Medicine, found that about 70 per cent of such contacts become infected in the absence of inoculation. The outbreak rapidly subsided after inoculation of the contacts. The same worker, with A. K. Sarkar,<sup>7</sup> also reports on cholera inoculation in the Faridpur district of Eastern Bengal, where, among 52,295 inoculated during a very severe epidemic, 3.3 per mille were subsequently attacked, against an incidence of 16.0 per mille in 203,956 uninoculated population living under identical conditions. Detailed figures in different parts of the district show still better results in several instances, and in all parts "the result has been invariably satisfactory to some extent or other." It was also clear that no negative phase of temporarily decreased resistance ever followed the inoculations, while there was distinct evidence that some benefit followed within even a day or two of a single dose of the vaccine.

**TREATMENT.**—The use of **Atropine** is discussed by A. N. Sen.<sup>8</sup> It was first tried by Sir L. Rogers at the suggestion of Lauder Brunton, with benefit in doses of  $\frac{1}{100}$  gr. by injection, and Sen regards repeated collapse with no tendency to rise of temperature and absence of urinary secretion as an indication for the drug, but it should be avoided if tympanites or hyperpyrexia is present.

**REFERENCES.**—<sup>1</sup>*Ind. Med. Gaz.* 1931, Feb., 61; <sup>2</sup>*Calcutta Med. Jour.* 1930, July, 1; <sup>3</sup>*Ind. Jour. Med. Research*, 1931, April, 1255; <sup>4</sup>*Trans. Roy. Soc. Trop. Med. and Hyg.* 1931, June 30, 29; <sup>5</sup>*Ind. Jour. Med. Research*, 1930, Oct., 527; <sup>6</sup>*Ind. Med. Gaz.* 1930, Oct., 546; <sup>7</sup>*Ibid.* March, 135; <sup>8</sup>*Ind. Med. Gaz.* 1931, July, 390.

**CLEFT PALATE.** (See HARE-LIP AND CLEFT PALATE.)

**CÆLIAC DISEASE.** (See also PARATHYROID GLANDS.)

Reginald Miller, M.D., F.R.C.P.

The causation of cœliac disease remains extraordinarily mysterious, and, as is not uncommon in medical diseases, progress is being made at present more by the exclusion of possible causes than by the production of positive evidence in favour of any one particular cause. Pancreatic deficiency, chronic enteritis, and bacterial infection may be quoted as factors once suggested and long ago disproved. Two further hypotheses amongst others have been put forward, and L. G. Parsons<sup>1</sup> adds to his valuable contributions on this disease by producing proofs against the acceptance of these possibilities. First, there was J. Ryle's suggestion that the defective fat-absorption from the intestine in cœliac disease was due to obstruction of the lacteals. Parsons reports that in a fatal case he was able to inject the lacteals with methylene blue, thus demonstrating their patency. Secondly, there was the view of A. Moncrieff and W. W. Payne that the food-fat was really absorbed into the blood but re-excreted into the intestine, and they supported their opinion by blood analyses which they claimed to show an unduly high percentage of fat. In disproving this not very attractive theory Parsons has come upon some interesting results. For one thing he has been able to show by feeding experiments that the nature of the faecal fat varies with the nature of the food-fat—in other words, that the fat in the stools is largely unabsorbed food-fat. Also he has demonstrated that the amount of fat in the blood in a cœliac child is less than the normal: such children show, that is, a hypolipæmia just as they show a hypoglycæmia.

We may now be said, therefore, to have much more complete proof of the truth of the view which has been held by most authorities of recent years—namely, that the essential fault in cœliac disease is one of *absorption* of fat—and to explain this we are, by the exclusion of other possibilities, almost forced

to suspect some defective action of the bile-salts, without whose action fat cannot be properly absorbed from the intestine. W. B. Cheadle many years ago suggested this; from the term he used ('acholia') he seems to have envisaged a suppression of hepatic function. But it has been known for some years that the pallor of the stools in cœliac disease is not due to absence of bile but to a masking of the bile-pigment by the excess of fatty acids in the fæces. Bile, therefore, reaches the intestine, but is it normal bile, and in particular does it contain bile-salts in their proper amounts? To test for minute quantities of bile-salts is a difficult matter, but it now appears that bile-salts are certainly present in the fæces in cœliac disease, though it cannot be determined if they are there in proper amounts. It is at this point that some new work by Olive MacRae and N. Morris<sup>2</sup> is of considerable interest. They state that the effective action of bile-salts in fat absorption depends not only on the presence of the salts in sufficient quantity, but also on the reaction of the medium in which they work. They conclude from rather elaborate studies that in this disease there is a shift to the alkaline side in the intestinal contents and probably also a deficiency in bile-salts; and they think that these two factors account for the defect in fat absorption.

One other recent paper requires mention. H. Wieland and H. Sorge<sup>3</sup> have attempted to demonstrate more exactly the precise action of bile in fat absorption, and have come to the conclusion that the most important factor is what they call the 'choleic acid principle', which has the function of transporting insoluble fat and fatty acid through the intestinal wall. Parsons<sup>1</sup> is now attempting to discover if the bile in cœliac disease has this function in proper degree.

REFERENCES.—<sup>1</sup>*Lancet*, 1931, i, 61; <sup>2</sup>*Arch. of Dis. Childh.* 1931, vi, 75; <sup>3</sup>*Quart. Jour. Med.* 1930, xxxiii, 465.

### COLITIS, ULCERATIVE.

Robert Hutchison, M.D., F.R.C.P.

Judging from the number of papers which appear about it, this disease would seem to be on the increase. In the MEDICAL ANNUAL for 1931 (p. 101) the subject was dealt with at some length, especially from the point of view of treatment, but several publications have appeared since which require brief notice.

A. F. Hurst<sup>1</sup> still adheres to his view that the disease is a form of bacillary dysentery. Failure to find the bacillus in the stools is, he says, of no importance, as in the chronic cases this is often impossible owing to the organism being present only in the depth of the lesions. On the other hand, the reviewer in a large number of cases has never found the blood serum agglutinate any form of dysentery bacillus. Hurst is apparently less enthusiastic than he was about the use of polyvalent **Antidysenteric Serum** in the disease, but claims that it usually produces 'a certain amount of improvement'. He prefers **Tannic Acid** (1 to 2 gr. to one ounce) for local irrigation, or **Hydrogen Peroxide** (one drachm to one pint).

B. Haskell and A. Cantarow<sup>2</sup> claim success from treatment by **Calcium and Parathyroid** in chronic cases, but the rationale of the treatment is not clear. They give 30 gr. of calcium lactate three or four times daily three and a half to four hours after meals, and inject 20 to 30 units of parathormone intramuscularly at intervals of forty-eight to seventy-two hours, depending on the severity of the symptoms. As their treatment also included a non-irritating diet and the use of belladonna and kaolin it is difficult to know how much of the apparent benefit was due to calcium.

J. Burnford<sup>3</sup> has treated a number of cases successfully by **Ionization** with zinc sulphate ( $\frac{1}{2}$  per cent) in quantity up to the limit of tolerance, a special

flushing electrode being used. The strength of current and the duration of application depend upon the case. The treatment seems rational.

P. Bayer<sup>1</sup> has studied twenty cases in South Africa. Like many others he has failed to find Bargen's diplococcus, but as he did not use Bargen's technique his results are not of much value. He had no success with antidyenteric serum or vaccines, but speaks highly of **Appendicostomy**, especially in fulminating cases and in chronic ones with repeated exacerbations.

C. D. Murray<sup>5</sup> has approached the question of etiology and treatment from a new point of view by inquiring into the life-histories and mental attitudes of a number of patients suffering from ulcerative colitis. He finds that mental conflicts and anxiety states were often associated with the appearance of the disease or with relapses. **Psychotherapy** would therefore appear to have a place in treatment.

As regards the use of **Vaccines** in cases of colitis H. Surmont and R. Buttiaux<sup>6</sup> have some interesting observations. They are of opinion that the milder forms of colitis are due to an increased virulence of the ordinary intestinal organisms, and therefore lend themselves well to treatment by stock vaccines. The graver forms, on the other hand, are due to foreign organisms, and if vaccine treatment is to be successful in such cases care must be taken to identify the responsible organism in each case. This involves previous cleansing of the bowel and the taking of scrapings. The preparation of the vaccine is troublesome, and it is best administered by the mouth with special precautions. The whole treatment is exacting both for doctor and patient, but, according to the authors, is worth while.

REFERENCES.—<sup>1</sup>*Brit. Med. Jour.* 1931, i, 693; <sup>2</sup>*Amer. Jour. Med. Sci.* 1931, Feb., 180; <sup>3</sup>*Brit. Med. Jour.* 1930, ii, 640; <sup>4</sup>*Jour. Med. Assoc. S. Africa*, 1930, July 26, 407; <sup>5</sup>*Amer. Jour. Med. Sci.* 1930, Aug., 239; <sup>6</sup>*Presse méd.* 1930, July 16, 956.

## COLON, SURGERY OF. (See also SYMPATHETIC NERVOUS SYSTEM, SURGERY OF.)

A. Rendle Short, M.D., F.R.C.S.

In two long articles, H. Finsterer,<sup>1</sup> of Vienna, gives an account of his experiences of the surgery of the colon—404 operations in twenty-three years. Of 10 cases of volvulus of the sigmoid flexure, he resected 7 in one stage without a death. The others had two- or three-stage operations; 2 died. He has on 6 occasions resected the caecum, ascending colon, and beginning of the transverse colon for chronic constipation with dilatation and atony of the large bowel, but only 3 were cured. In 12 cases he resected the sigmoid for similar reasons; 9 were cured and 1 was improved. He refers to the inflammatory pseudo-tumours sometimes met with in the caecum and ascending colon. An entero-anastomosis is often the best treatment. They must not be excised if they contain pus.

**Resection of Growths of Colon.**—Removal of growths of the right colon can usually be done in one stage, but an immediate end-to-end anastomosis after resection of a growth of the pelvic or iliac colon is precarious, though some margin of safety may be obtained if the caecum is temporarily opened at the same time. To avoid the risk of leakage, Paul in England and Mikulicz in Germany evolved the well-known two-stage operation, which is safer but tedious. To hasten the closure, H. B. Devine,<sup>2</sup> of Melbourne, modifies the procedure as follows. The loop of bowel containing the cancer having been freed, and brought out through the wound, the proximal and distal limbs are sutured together, and the abdominal wall is closed around them by stitches. The growth is resected at once, or twenty-four hours later; the mucosa is cut shorter than the seromuscular coats, which project as a cuff. Clamps are applied for a day, or less. Next day, the Dupuytren enterotome, or better an

enterotome with bevelled edges, is applied to the spur, and a few sutures are inserted to approximate the cut ends of the bowel (Fig. 16) and make the fistula as small as possible. The enterotome is tightened day by day till it cuts through after four days and comes away (Fig. 17). The lumens are now united within the abdomen. After another week, the patient being in bed and no anæsthetic required, the protruding mucous membrane is trimmed away and the fistula closed with catgut stitches. Probably this will need repeating once or twice. After the fourth week, the protruding bowel will probably have withdrawn inside, more or less, and the fistula will be nearly closed. The patient may get up. A fortnight later, under novocain, the bowel stump is dissected out, the fistula (if any) closed, and the abdominal muscles are sewn loosely over (Fig. 18).

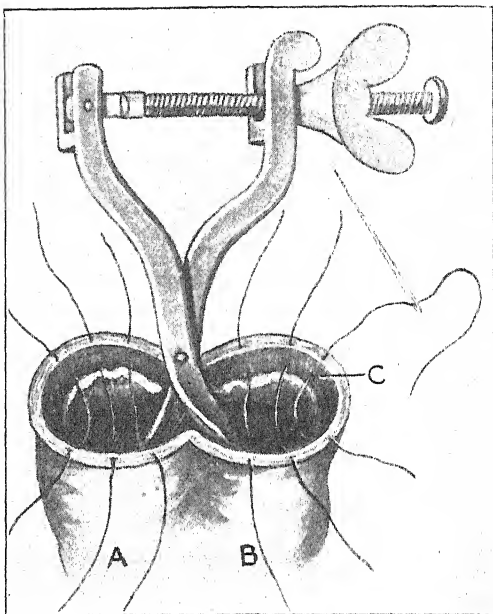


Fig. 16.—A, Distal segment. B, Proximal segment. Sutures introduced ready to be tied. C, Area inside bowel denuded of mucous membrane.

(Figs. 16-18 by kind permission of 'The Lancet'.)

**Cancer of the Colon.**—In the second of Finsterer's<sup>1</sup> articles mentioned above he sets forth the present state of opinion and practice in the Vienna school of surgery.

**DIAGNOSIS.**—With reference to diagnosis, the author warns us that an increase of weight is no proof that cancer is not present; the stasis helps absorption, and

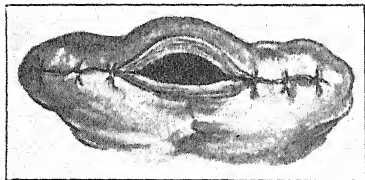


Fig. 17.—Ends of bowel after removal of enterotome.

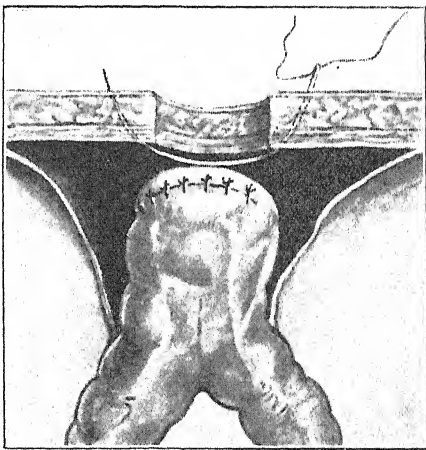


Fig. 18.—Extra-abdominal part dissected free and dropped back with closure of abdominal parietes.

the weight of the faeces may also count for a little. X-ray examination is an important help, but not to be trusted absolutely; if symptoms suggest cancer, but barium skiagraphy says 'no', the examination ought to be repeated in a fortnight. If obstruction is present, a plain X-ray of the patient standing often shows gaseous distension and liquid surfaces, usually three of the latter in cases of cancer of the descending colon (in the ascending, transverse, and descending colons respectively) (*see article on INTESTINAL OBSTRUCTION*). If in a case of suspected cancer of the colon a growth cannot be definitely excluded by repeated X-ray examinations, an exploratory laparotomy, which after all carries a trifling risk, is strongly indicated.

**OPERATIVE TREATMENT.**—One should not be too easily turned aside from attempting a radical cure, even if the growth is adherent to the abdominal wall or other viscera. Finsterer quotes with approval the dictum of his surgical teacher, that "a surgeon who saves one out of ten absolutely lost cases has performed something great." A one-stage resection and suture in the presence of obstruction or filled intestines is of course very unwise; the risks are too great. In such cases, for cancer of the right colon a two-stage resection, or in the case of cancer of the left colon caecostomy followed by resection, is indicated.

In a few cases, especially when there is sepsis around a growth, the best thing to do is to exclude the diseased portion of the bowel by a short-circuiting, and resect it later. In cases of cancer of the hepatic flexure treated as an emergency measure by caecostomy, the safest way to proceed is to perform ileo-transversostomy, closing both ends of the excluded loop (terminal ileum, caecum, ascending colon, hepatic flexure). A few weeks later the blind loop is removed in a clean field. A drainage colostomy should always be made far above the obstruction; a short-circuiting for irremovable cancer should be as near as possible, or there will be colicky spasms of the long loop. For this reason, for a cancer of the splenic flexure, an anastomosis of the transverse colon to the sigmoid is much better than ileo-sigmoidostomy.

Turning to operative details, Finsterer objects to ether, because of the intestinal paralysis that follows; he prefers local anaesthesia. Side-to-side junctions are better than end-to-end, because they can be made absolutely safe if three layers of sutures are used; if the intestine becomes distended by gas, it will burst an end-to-end anastomosis but not a lateral. The opening should be four inches long. He quotes figures to show a 46 per cent mortality from end-to-end union, as against 11.7 per cent for side-to-side. He does not trust the so-called aseptic closed methods. He always drains the neighbourhood of the junction.

With reference to the closure of the caecostomy or colostomy, the first is easy, and is done extraperitoneally. The latter requires an intraperitoneal resection and end-to-end anastomosis. Dupuytren's enterotome may do harm. The parietal peritoneum is sewn around the junction and so arranged that if there is leakage it shall be extraperitoneal, and escape freely through the abdominal wall.

The *after-treatment* is important. No opiates are given. **Pituitary Extract** is injected on the day after operation and regular daily bowel lavage given with warm water, in small quantities and under low pressure, so as to wash out intestinal contents from the first, and prevent the accumulation of hard faeces, which will quite likely burst the anastomosis on the sixth or eighth day after operation.

Some results given are as follows. Mortality for resection of cancer of colon was 25 per cent. Of 41 surviving operation and traced after five years, 3 were lost sight of, 16 died within five years, 4 died later than five years and not

of cancer, 18 were alive and well over five years—that is, 40·8 per cent of those resected, and 53·6 per cent of those surviving operation, were five-year ‘cures’.

Closure of artificial anus by the intraperitoneal method was followed by death in only 1 case out of 42 operated on, and there were no permanent fistulae.

D. Cheever,<sup>3</sup> reporting on 193 cases which were treated over seventeen years at the Peter Bent Brigham Hospital, Boston, concludes that whilst some cases are very malignant, the majority are late to form metastases, and therefore offer a reasonable chance of cure. The mortality of operation has been 19 per cent. Even if there are metastases in the liver or peritoneum, or enlarged glands, resection may still be the best means of affording the patient relief. Such cases live, on an average, seventeen months. “A resection is often the best palliation.” Of 63 patients who survived operation (resection), 13 were alive (or died without recurrence) over 5 years; 16 were alive less than five years; 2 died without recurrence under five years; 25 died of recurrence, mostly within two years; and 7 were lost sight of. The patients treated by a preliminary colostomy showed a mortality of 9·6 per cent; without colostomy, 25·5 per cent. Cases beginning with an attack of acute obstruction actually did better, in the long run, than those with a tumour, or chronic obstruction.

**Diverticulitis.**—W. J. Mayo<sup>4</sup> states that 2139 cases of diverticula have been treated at Rochester. Nearly all were over forty. In 696 cases, diverticulitis was present. The cases fall into four groups: (1) *Self-limiting diverticulitis and peridiverticulitis*. These patients have pain, fever, gaseous distension, and a tender swelling; they are usually well in a few days. (2) *Abscess or fistula formation*. The fistula may open into the bladder or elsewhere. (3) *Intestinal obstruction*. Usually only partial. (4) *Cancer developing on diverticulitis*. This appears to be a definite risk. Only a quarter of the patients needed operation. Abscesses have to be opened. Obstruction is treated by colostomy, and resection later. For vesico-intestinal fistula, C. H. Mayo separates the bowel and the bladder, and after suturing the openings, brings the diseased segment of the bowel up to the abdominal wall, interposing omentum opposite the fistula in the bladder. If the bowel leaks, the faeces will thus be shut off from the peritoneal cavity and the bladder, and will escape externally. A hole has to be torn in the omentum for the loop of bowel to pass through.

**Tuberculosis of the Colon.**—According to J. Anderson and W. T. Munro,<sup>5</sup> there are two types, the tuberculous caecal tumour, and diffuse tuberculous hyperplasia of the caecum and colon. The patients, as a rule, are young adults, and not phthisical. Both types may give rise to pain and obstruction symptoms. In two cases examined, the infection was with a bovine type of bacillus. A rather characteristic X-ray sign is that the barium in the caecum gives a string-like shadow instead of a proper filling. In the diffuse type, the ‘string’ may extend as far as the splenic flexure.

REFERENCES.—<sup>1</sup>*Arch. f. klin. Chir.*, 1931, Feb. and March, 349 and 1; <sup>2</sup>*Lancet*, 1931, i, 627; <sup>3</sup>*New Eng. Jour. Med.*, 1930, Sept., 462; <sup>4</sup>*Ann. of Surg.*, 1930, Oct., 739; <sup>5</sup>*Edin. Med. Jour.*, 1931, March, 159.

**COLOUR-BLINDNESS.** (See VISUAL TESTS FOR MOTOR DRIVING.)

**CONGENITAL DISLOCATION OF THE HIP.** (See HIP, CONGENITAL DISLOCATION OF.)

**CONGENITAL SYPHILIS.** (See SYPHILIS.)

**CONGENITAL TORTICOLLIS.** (See TORTICOLLIS, CONGENITAL.)

**CORNEA, DISEASES OF.***W. S. Duke-Elder, M.D., F.R.C.S.*

**Corneal Ulcers.**—One of the most interesting suggestions of the past year in the treatment of corneal ulcers is that of K. Sabatzky,<sup>1</sup> who recommends the use of **Oil of Wintergreen**. He claims for this treatment extremely favourable results, not only in cases of serpyiginous ulcers, pneumococcus ulcers, abrasions, erosions, and so on, but also that it improves, and in some cases eradicates, corneal opacities. If these claims are justified, the importance of such a method of treatment is, of course, of the first moment. The technique he advises is that after anaesthetization of the cornea the ulcer is cleansed and then everted to remove mucous and necrotic tissue, thereafter synthetic oil of wintergreen is massaged into the ulcer with a spatula or glass rod. This is allowed to remain in contact with the corneal tissues for two minutes, when the cornea is dried with cotton-wool and a dressing of atropine ointment and a bandage are applied for two days. He claims that the cornea heals without scars, facets, or opacities, and that little or no astigmatism results in healing; in a series of 24 cases he claims restoration of vision to 6/5 in 23. In the case of old opacities and leucomata the surface of the epithelium is broken by a sharp wooden pick which is dipped into the oil, thus introducing it into the tissues. Sabatzky claims that the oil not only acts as a germicide but that it achieves some chemical union with the cell protoplasm, and in so doing acts as a stimulant to the growth and nutrition of new and transparent corneal tissue. [So far as the reviewer is concerned, however, the three cases (all of severe and acute ulcers) which he treated by this method, following out so far as is possible the directions of Sabatzky, failed to substantiate these claims. In each case the reaction was severe and the end-result worse than would have otherwise been anticipated. While the substantiation or refutation of these claims will be of more than ordinary interest, caution should therefore be observed in following out the treatment.—W. S. D.-E.]

In the treatment of corneal ulcers by **Electro-cauterization**, Vydovsky<sup>2</sup> recommends the employment of chromicized wire and claims that with its use the subsequent scars are small. Stastnik<sup>3</sup> strongly advocates the employment of **Copper Thiosulphate**, particularly as an aid to clearing away the scars left by trachoma. It is used locally on the cornea as drops or as an ointment in a concentration of 10 per cent, and its application is profitably preceded by massage and expression of trachomatous follicles. The author states that its effect is increased by a simultaneous intravenous injection in which 2 gr. of the salt are dissolved in distilled water with 1 c.c. of 2 per cent solution of copper sulphide added. He employs ten such injections at intervals of four days.

**Acne Rosacea.**—The serious permanent damage which acne rosacea not uncommonly effects upon the cornea is not generally fully realized, and it may be well to renew our knowledge of this disease in the light of the full clinical studies recently undertaken by J. H. Doggart<sup>4</sup> and J. Verdaguer.<sup>5</sup> The majority of sufferers are women between the ages of 30 and 60 years. The condition begins with transient flushings of the face, recurring at varying intervals, and the onset may be so gradual that for many years there may be no evidence to warrant diagnosis in the intervals between the attacks. After repeated attacks, however, the vessels of the affected areas of the skin remain permanently dilated and cause a hyperplasia of the cutaneous glands which is manifested by the formation of papules, which occasionally suppurate. This sebaceous hyperplasia tends—especially in men—to affect the nose, and together with proliferative changes in the dermal connective tissue may produce the condition known as 'rhinophyma'. Since the condition of the skin of the face is attended by little or no pain, the evil effects are mainly cosmetic. In the great majority of cases, unless ocular complications supervene, these are

transitory, but in a large residuum the onset of facial exacerbations becomes associated with blepharitis, conjunctivitis, the occurrence of Meibomian cysts, and, most serious of all, corneal ulceration frequently accompanied by iritis.

Keratitis is chiefly confined to the corneal epithelium and the superficial layers of the substantia propria, where it produces greyish infiltrates and multiple ulcers. As occurs in the facial lesions, these show an intractable tendency to relapse, and each relapse may be associated with a fresh area of infiltration which is always accompanied by vascularization. The adventitious vessels are partly an extension of those which supply the ocular conjunctiva, and partly vessels of new formation. The cicatrization following ulcers may lead to localized thinning of the cornea, and with each successive attack the infiltration insinuates itself farther towards the pupillary region, so that in addition to the acute symptoms of corneal ulcers, serious interference with vision becomes imminent. A typical example is seen in *Plate XI*. This type of corneal involvement may become extremely severe and actual pustules involving the formation of interstitial abscesses may result. Pathologically, the lesion is characterized by folliculiform accumulations of lymphocytes bordering a central zone of epithelioid cells, which in late cases become interspersed with giant cells. No organism has been found so far in fragments of the corneal tissue excised from patients with acne rosacea keratitis, although, in 1924, Löwenstein succeeded in infecting the corneæ of rabbits by such inoculation. At the same time, with one exception, fragments of affected skin gave negative results on similar inoculation.

**TREATMENT.**—Treatment of the disease is extremely difficult. There is a definite tendency for new methods of treatment to give a temporarily favourable response, which after a short time rapidly falls away, and another attack obstinately resists any further application of the treatment which had promised so well. Moreover, individual patients appear to show great variations from each other in the way in which they respond to different therapeutic measures, and the fact that one person has been relieved by one method of treatment in no way guarantees that the same method will benefit another. There is no doubt, however, that the most efficacious treatment depends on the treatment of the general health, especially of the alimentary canal, in the correction of gastric hyper- or hypo-acidity, in the cutting down of excessive carbohydrates in the diet, and in a suitable degree of exercise. So far as local treatment is concerned, two recent methods have given considerable alleviation. The first of these is **Local Ultra-violet Light** applied directly to the corneal lesion (Doggart), and the second **X-ray Treatment** similarly applied (R. A. Greeves<sup>6</sup>). Further observations on the results of radiational treatment are necessary before the value of the method can be correctly assessed, but so far the results have certainly been encouraging.

REFERENCES.—<sup>1</sup>*Klin. Monats. f. Augenheilk.* 1929, lxxxiii, 498; <sup>2</sup>*Oft. Shornik*, 1929, iii, 523; <sup>3</sup>*Ibid.* 145; <sup>4</sup>*Brit. Jour. Ophthalmol.* 1931, xv, 446; <sup>5</sup>*Arch. de Oft. Hispano-Amer.* 1930, xxx, 409; <sup>6</sup>*Trans. Opt. Soc. U.K.* 1930, 1, 111.

### CORONARY ARTERY DISEASE. (See ANGINA PECTORIS AND CORONARY ARTERY DISEASE.)

### CORONERS' CASES AND MEDICO-LEGAL WORK. (See also LEGAL DECISIONS, RECENT.)

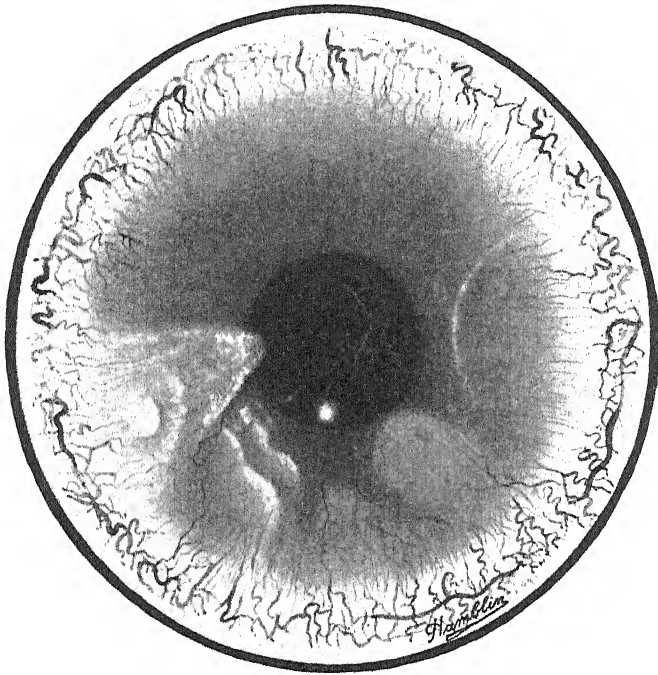
**G. E. Oates, M.D., M.R.C.P., D.P.H.**  
**Thallium and its Risks.**—G. R. Lynch and J. M. S. Scovell<sup>1</sup> report three cases of thallium poisoning. They state that a survey of the literature of the toxicology of thallium has made a deep impression on them, and they are of opinion that thallium acetate should not be used as an ordinary routine



PLATE XI

ACNE ROSACEA KERATITIS

(J. H. DOGGART)



The cornea of a man aged 50 years who had suffered from intermittent rosacea keratitis for seven years. Note the wedge-shaped and tongue-shaped opacities with numerous new vessels.

*By kind permission of the  
'Transactions of the Ophthalmological Society'*



treatment for ringworm of the scalp. They base their opinion on the following conclusions: (1) Thallium in itself is a highly toxic substance showing a marked similarity to lead, both in its chemistry and in its toxic symptoms, and the far-reaching effects of the poison are much greater than is generally supposed. (2) It has a definitely selective action on all forms of nervous tissue, and it has been demonstrated that even in infinitesimal doses it causes slight degenerative changes in the brain cells of rats. It is therefore most unlikely to leave the human brain entirely unchanged, and it seems impossible to be certain that it does not hinder further brain development. (3) The margin between an epilating and a toxic dose is extremely small and allows for no idiosyncrasies, whereas with X rays the dosage is very accurate, trouble is rare, and if a mishap occurs it is at least local. (4) Ringworm of the scalp is not in itself a fatal disease and, though often troublesome, can usually be cured by other means. It therefore does not seem justifiable to use such a powerful poison in an attempt to cure it a little more quickly. (5) It is quite easy to obtain thallium salts in a state of purity, and there is no reason to suppose that a solution which has been kept for some time can cause toxic phenomena more easily than a fresh solution.

J. Lansbury<sup>2</sup> reports a case where the scalp of a woman was almost entirely depilated. There were also toxic symptoms. It was found that she had for some five weeks been using a depilatory cream on her face. This cosmetic was analysed and found to contain a large percentage of thallium. W. E. Dixon<sup>3</sup> states that thallium rubbed into the skin does not depilate locally; it is only after absorption that it affects the hair. The employment of thallium in depilatory creams would appear to be highly dangerous, owing to the small margin between the depilatory dose and the toxic dose.

On the other hand, G. H. Percival<sup>4</sup> has investigated the heights and weights of both male and female children four months to two years after thallium administration at the Royal Infirmary, Edinburgh. He found no gross deviation from the normal, and no evidence to show that the continued normal growth and nutrition of children are adversely influenced as a result of the previous administration of thallium acetate in sufficient quantity to produce epilation of the scalp.

**Strychnine Poisoning in Children.**—J. Aikman<sup>5</sup> records two cases of fatal strychnine poisoning in children. In each case the child had, unknown to its parents, eaten sugar-coated laxative tablets intended for adults. The parents were unaware that the tablets contained poison and had taken no special care to keep them away from their children. Strychnine poisoning is most common in children under 5 years of age, especially those between 1 and 2 years. It is the most serious form of accidental drug poisoning in children under 5 years of age. The tablets most often causing strychnine poisoning are of the shotgun type, containing aloin, belladonna, jalapin, etc., with strychnine or nuxvomica. Since aloin is slow in action, requiring from ten to twelve hours, it would appear that strychnine and atropine, which are rapidly absorbed and excreted, can have but little modifying action upon the aloin.

B. Fantus<sup>6</sup> has tested pills of aloin with and without belladonna and strychnine on thirty students, and was unable to detect any essential difference. If pills and tablets containing strychnine were uncoated, the resulting unpleasant taste would prevent serious accidental poisoning in children. Strychnine poisoning is less common in Great Britain than in the U.S.A., in several States of which the use and sale of strychnine is poorly controlled by pharmacy laws.

**Carbolic Acid Poisoning.**—O. S. Gibbs<sup>7</sup> discusses the problem of limiting absorption in carbolic acid poisoning. The treatment he advises is based on the fact that carbolic acid is much more soluble in oil than in water, and thus

readily leaves a watery medium for one of oil, in which it remains pharmacologically inert. Oil should be applied freely to the site of absorption, so that in carbolic acid burns, washing in oil followed by soaked oily dressings should be the method adopted. When the acid has been swallowed the immediate administration of **Liquid Paraffin** to the stomach contents renders much of the carbolic acid unabsorbable even by damaged mucous membrane. Paraffin has the advantage over vegetable or animal oils in not being rendered absorbable by digestive processes. Treatment by liquid paraffin has the further advantage that it can be quickly applied, valuable time being often wasted before a wash-out tube can be passed.

**Acute Mercurial Poisoning.**—B. I. Johnstone<sup>8</sup> reports on 21 cases of acute mercurial poisoning treated by himself. Bichloride of mercury was the drug responsible in 18 of the cases. Two fatal cases were due to the use of a vaginal douche. Two cases due to mercurial inunction recovered. An early start is the important feature in treatment, and efforts should be chiefly directed towards prevention of absorption. Mechanical removal of the poison is the first essential, as once a lethal dose has entered the circulation, the chance of saving life is small. Within a few hours after ingestion the salivary glands, gastric mucosa, and large intestine begin to excrete mercury. If reabsorption is to be prevented, repeated lavage of these areas is important. A mouth-wash, consisting of a saturated solution of **Sodium Thiosulphate**, is used frequently. The author advises irrigation of the stomach and colon twice daily. In his later cases transduodenal irrigation was performed daily, a warm saturated solution of sodium bicarbonate being passed down the tube until the patient expressed a desire to defecate. In some cases a saturated solution of magnesium sulphate was used as a stimulant, biliary drainage being done for several hours until 500 c.c. or so of bile were drawn off. The author uses sodium thiosulphate, both by mouth and intravenously, but seems doubtful as to its efficacy. None of his patients were operated upon for decapsulation of the kidney. He believes in forced fluid administration as hastening the elimination of mercury unless there is a specific contra-indication, such as a damaged heart.

R. Garcin and others<sup>9</sup> draw attention for the first time to mercurial poisoning arising from the fumes generated by the firing of percussion caps in shooting booths with insufficient ventilation. The caps are charged with fulminate of mercury and the dust is inhaled by the attendants.

**Poison-bearing Fish.**—E. Schulmann and J. L. Ravier<sup>10</sup> record a case of supposed fatal inoculation by a weaver. D. M. Greig,<sup>11</sup> summarizing present knowledge of British poison-bearing fish, does not consider this case can be one of poisonous inoculation. The poison-bearing fish of the British Isles are *Trachinus draco*, the larger weaver; *Trachinus vipera*, the smaller weaver; and, according to some, *Trachinus arceneus*, the sand-weaver. Professional fishermen avoid these fish, but amateurs may become wounded from catching them in shrimping-nets. Accidental injury when bathing is less common. Certain spines on these fish are provided with poison-glands. The general symptoms are serious. There is acute pain at the site of inoculation spreading up the limb. This may be followed by respiratory depression, delirium, convulsions, and death. The site of inoculation swells; it may slough and leave an indolent wound. (See also ERYSIPELOID.)

**Cremation Certificates.**—Amending regulations came into force in 1930. Two medical certificates must still be given as a preliminary to cremation, one by the medical practitioner who has attended the deceased during his last illness and who can certify definitely as to the cause of death. The other confirmatory medical certificate can now be given by any registered medical

practitioner of five years' standing, provided that he is not a relative of the deceased or a relative or partner of the doctor who has given the medical attendant's certificate.

REFERENCES.—*Lancet*, 1930, ii, 1340; <sup>2</sup>*Brit. Med. Jour.* 1931, i, 320; <sup>3</sup>*Proc. Roy. Soc. Med.* (Dermatol. Sect.), 1927, xx, 77; <sup>4</sup>*Brit. Med. Jour.* 1931, i, 575; <sup>5</sup>*Jour. Amer. Med. Assoc.* 1930, xcv, 1661; <sup>6</sup>*Useful Cathartics, Chicago, Amer. Med. Assoc.* 1927, 133; <sup>7</sup>*Brit. Med. Jour.* 1931, i, 581; <sup>8</sup>*Jour. Canad. Med. Assoc.* 1931, April, 500; <sup>9</sup>*Bull. Soc. méd. Hôp. de Paris*, 1931, March 9, 335; <sup>10</sup>*Progrès méd.* 1929, lvi, 2190; <sup>11</sup>*Edin. Med. Jour.* 1930, Nov., 638.

### CRANIAL MURMURS.

Macdonald Critchley, M.D., F.R.C.P.

Almost a century ago, John D. Fisher<sup>1</sup> suggested that auscultation of the skull might prove of diagnostic importance; recent experiences have amply substantiated this view. Although Sir Victor Horsley made auscultation of the skull an essential part of his routine examination of a patient, H. Cushing and P. Bailey<sup>2</sup> have recently stated that "cephalic auscultation is a forgotten practice". Contributions by W. Osler<sup>3</sup> and by G. F. Still<sup>4</sup> on head murmurs in children have materially advanced our knowledge on this subject, and a recent paper by L. P. Hamburger<sup>5</sup> is an able exposition of the present status of cranial auscultation. Hamburger first deals with cerebral murmurs audible in children, and, while admitting that they are commonly encountered in anæmic or rickety subjects, agrees that they are probably without pathological significance. Still has pointed out the rarity of these murmurs in children over the age of four years. The origin of this murmur is not known; a disparity between the growth of the internal carotid artery and its bony canal has been suggested, leading in this way to a 'temporary stenosis'. An undue tortuosity of the intracranial portion of the carotid during early life has also been suspected.

Among the pathological cranial bruits in the adult, Hamburger describes those due to intracranial or extracranial arteriovenous aneurysms. The most characteristic example occurs when a communication exists between internal carotid and cavernous sinus, due to a fracture of the base of the skull, and often accompanied by pulsating exophthalmos. Angiomatous tumours of the brain may also be the cause of a cranial bruit; in such cases the murmur is typically a continuous one, with systolic intensification. Much less commonly a bruit may be audible with other types of cerebral neoplasm of very great vascularity.

True aneurysms of the cerebral arteries may very exceptionally be accompanied by an audible murmur. Another cause may arise in arteriovenous communications—often of traumatic origin—lying outside the cranium, with frequent involvement of the diploic veins.

Lastly, a cerebral bruit may be transmitted from some structure outside and below the cranial cavity. Thus, a murmur may be conducted upwards from such sources as a calcareous external or common carotid artery. In Graves' disease, in some valvular disorders of the heart, and possibly also in the coarctation of the aorta, cephalic bruits may be audible.

REFERENCES.—<sup>1</sup>*Amer. Jour. Med. Sci.* 1838, xlv, 24; <sup>2</sup>*Tumours arising from the Blood-vessels of the Brain*, 1928, 71; <sup>3</sup>*Boston Med. and Surg. Jour.* 1880, ciii, 29; <sup>4</sup>*Brit. Jour. Child. Dis.* 1921, xviii, 173; <sup>5</sup>*Amer. Jour. Med. Sci.* 1931, June, 756.

**DEAFNESS.** (See EAR, AFFECTIONS OF.)

**DEJERINE-SOTTAS DISEASE.** (See NEURITIS, HYPERTROPHIC INTERSTITIAL.)

**DEMENTIA PARALYTICA.** (See MALARIA.)

**DEMENTIA PRÆCOX.** (*See MENTAL DISEASES.*)**DENGUE.***Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

Further experimental work on dengue-fever transmission has been recorded by American observers. J. S. Simmons<sup>1</sup> publishes an account of the recent work of the U.S. Army Medical Department Research Board in the Philippines, where the disease is very prevalent. Monkeys have been proved to be susceptible to dengue, as although they do not show recognizable signs of the disease after being bitten by infected mosquitoes, yet their blood becomes infective to human beings; but only the hill monkeys take the disease, for the lowland ones appear to have developed immunity as the result of natural infection, so they may possibly be a common source of human infection. R. L. Holt and J. H. Kintner<sup>2</sup> record experiments to ascertain the location of the virus in infected mosquitoes, but they found all parts to be equally infective, and they consider eleven to fourteen days to be the time required for the virus to reach a concentration permitting infection of man. Further work by E. P. Snijders, E. J. Dinger, and W. A. P. Schuffner<sup>3</sup> proved that infected *Aedes* could be transmitted long distances, such as from Sumatra to Amsterdam, without losing their infectivity. Both *Aedes aegypti* and *Aedes albopictus* are efficient carriers. The symptomatology of dengue is even more varied than is generally recognized. J. S. Simmons and others<sup>4</sup> have tested the possibility of the transfer of dengue virus from infected to normal mosquitoes during copulation with a positive result in one instance, but they regard it as being rare and unimportant. R. Hamlyn-Harris<sup>5</sup> points out that in Queensland the *Aedes argenteus* carrier of dengue breeds only in the immediate vicinity of houses, and by the inspection of these the breeding places were reduced from 44.5 to 3.9 per cent; he therefore considers this to be the best prophylactic measure.

REFERENCES.—<sup>1</sup>*Amer. Jour. Trop. Med.* 1931, March, 77; <sup>2</sup>*Ibid.* 103; <sup>3</sup>*Ibid.* May, 171; <sup>4</sup>*Ibid.* 199; <sup>5</sup>*Ann. Trop. Med. and Parasitol.* 1931, March 31, 21.

**DENTAL PAIN: TOOTHACHE.***L. E. Claremont, M.D.S., M.R.C.S., L.R.C.P.*

General practitioners are frequently consulted regarding this common and universal complaint. Dentistry is rapidly taking such a prominent and distinct place in the healing art that most medical men, and certainly the post-war medical students, pay very little attention to the pathology of the dentition. Nevertheless it is important for the doctor to be in a position to diagnose dental conditions, and for those in outlying country districts to be prepared to extract teeth in an emergency.

'Toothache' is a useful term for the layman, but we all appreciate the fact that pain associated with a particular tooth or series of teeth may be difficult to account for in certain cases. The text-books define odontalgia as 'pain in a tooth', and neuralgia as 'pain in the course of a nerve'. This difference should be clearly appreciated in order to arrive at a correct solution of the problem. As in general surgery, these conditions may be acute, subacute, and chronic. Odontalgia may also be local to the tooth itself or referred to another tooth. The referred type of pain presents the main difficulty, and has frequently led to the removal of the wrong tooth. Keeping in mind the anatomical distribution of the fifth cranial nerve, it is readily appreciated that referred pain does not jump across the middle line. It is frequently referred to the same tooth in the opposing jaw on the same side of the mouth, and is occasionally associated with a tooth in front of or behind the diseased one in the same jaw.

Conditions giving rise to odontalgia may be conveniently grouped as follows :

*A. Disease or Injury of the Dental Pulp.—*

1. Inflammation (hyperæmia) resulting from caries, erosion, abrasion, attrition, proceeding to :
  - a. Exposure of the pulp.
  - b. Degeneration of the pulp (fibrous, fatty, calcareous).
  - c. Suppuration and death of the pulp with or without 'exposure'.
2. Fracture of the tooth involving the pulp.
3. Fracture of one or more dental tissues without exposure of the pulp, but permitting of abnormal stimuli being conveyed to it.
4. Electrical action.

*B. Disease or Injury of the Periodontal Membrane.—*

1. Inflammation (periodontitis) caused by :
  - a. Direct extension from an infected pulp.
  - b. Direct extension from an infected gum.
  - c. Direct injury, either mechanical or chemical.
  - d. Extension of general periosteal disease of the jaw.

*C. Ulcerative Condition of the Mucous Membranes of the Mouth.*

In addition to the causes enumerated for odontalgia, neuralgic pain may arise from :—

1. Malposition and difficulty in the eruption of teeth.
2. Disease of the nose and its accessory sinuses.
3. Disease of the eye.
4. Compression of nerve filaments by osseous and fibrous tissue.
5. Odontomata.
6. General systemic diseases.
7. Intracranial affections.
8. True trigeminal neuralgia—neuralgia major or 'tic douloureux'

### DIAGNOSIS.

In order to arrive at a diagnosis, let us briefly consider these conditions.

**1. Odontalgia.—**

*a. Inflammation of the Dental Pulp or Periodontal Membrane.*—There are four factors to consider :—

i. *The type of pain.*—In acute pulp infections this is sharp, shooting, and stabbing. In acute periodontitis it has a dull, steady, gnawing character. Where the inflammation has passed on to suppuration the pain tends to become more intense, with a tendency to throb. As soon as the pus associated more particularly with pulp infection has burrowed through the alveolar bone and found an outlet into the soft tissues, the pain tends to subside. In the case of an acute dento-alveolar abscess it is still a common thing to find some dentists and doctors advising patients to wait until the swelling has subsided rather than deal with the cause at once. We are all aware of the danger of leaving a suppurating appendix alone. Why should there be any timidity with dental pus ? The blood-stream is bound to receive an unnecessary dose of toxins. Surgical sepsis with pus formation always receives immediate attention, and the part affected is drained as soon as possible. To wait until pus arising from dental origin has subsided is surely contrary to all the teaching of surgical pathology. The formation of granulation tissue as a definite stage in the process of repair cannot be formed before the pus is removed or absorbed. In chronic infections of either tissue the pain is less intense, frequently periodic, and shows a tendency to be referred. The investigation of these cases may be difficult. Provided there is no obvious cavity or diseased periodontal membrane with pocket formation, and possibly the wedging of food between two or more teeth, it is important to see if any teeth are missing from the dental arch ; also note should be made of any large fillings under which the pulp may be inflamed or degenerating.

Besides the true referred pain one occasionally meets with, a condition that may be called 'visceral referred neuralgia' is not uncommon.

Head has worked out certain areas that appear to be associated with dental disease. These areas are supposed to represent the segmental origin of the nerves for pain, heat, and cold. These segmental areas do not correspond to the distribution of the peripheral branches of the cranial nerve. They are as follows :—

TEETH AFFECTED	PAIN REFERRED TO
<i>Maxilla</i> —Incisors	.. Fronto-nasal.
Canines	.. Naso-labial.
1st Premolar	.. Naso-labial.
2nd Premolar	.. Temporal or Maxillary or Parietal.
1st Molar	.. Maxillary.
2nd Molar	.. Mandibular.
3rd Molar	.. Mandibular.
<i>Mandible</i> —Incisors	.. Mental.
Canines	.. Mental.
1st Premolar	.. Mental.
2nd Premolar	.. Doubtful.
1st Molar	.. Hyoid.
2nd Molar	.. Hyoid.
3rd Molar	.. Hyoid or Superior Laryngeal.

ii. *Thermal changes*.—Testing the suspected teeth with heat or cold is often of great value. In pulpitis there is an exacerbation of the pain, whereas there is no change in periodontal inflammation.

iii. *Percussion*.—Tapping the suspected teeth gives severe pain in periodontitis and no change with pulpitis, provided of course the inflammation of the pulp has not extended beyond the tooth apex.

iv. *The placing of a wisp of cotton-wool in the cavity*.—With an inflamed pulp this is painful, and naturally has no effect if one is dealing with periodontitis.

Apart from systemic conditions which will be referred to later, there is one other type of indefinite, periodic, and generalized oral pain—that associated with early pyorrhœa. This is probably due to irritation of the cementum from inflammatory exudate at the gum margin. In the later stages of the disease the interdental bony septa are absorbed, and the cementum may be again troublesome. Inflammation of the pulp and periodontal membrane should be eliminated before passing to possible factors further afield.

The other causes listed above under odontalgia, such as *fracture of a tooth*, with or without pulp involvement, may be readily seen with a dry surface and a good light.

Under the heading *electrical action*, one refers to the pain set up when metals of a different electrical potential come in contact, such as gold and amalgam—an important matter for the dental surgeon to consider in the construction of the various restorations. A good example is a gold denture band fitting round an amalgam filling.

b. *Ulcerative Conditions of the Mucous Membranes*.—These need no special comment. Odontalgic and neuralgic pain is frequently very marked in cases of stomatitis, particularly where there is ulceration. In obscure cases the dentist's routine examination in a good light with dry tooth surfaces and sharp probes of varying shapes is not sufficient to rule out the mouth as a possible cause of the pain. Considerable help may be obtained by: (1) Testing the reaction time of the dental pulps in healthy and suspected teeth with heat, cold, or a small electric current. (2) Transilluminating the alveolar processes. (3) Obtaining good skiagrams.

The X-ray is particularly valuable in finding unerupted teeth, hidden roots, granulomata, cysts, tumours, and, last but by no means least, interstitial



cavities. There is increasing evidence to show that the most thorough and detailed examination with mirror and probe sometimes fails to reveal interstitial caries which has frequently advanced sufficiently to cause pain. In order to be absolutely sure X-ray films should be taken of all the teeth.

## 2. Neuralgia.—

*Compression of nerve filaments* by osseous and fibrous tissue is probably a commoner cause of severe neuralgia than is generally imagined.

*Neuralgia major*, or *tic douloureux*, necessitates a very careful and systematic search. Usually these cases have lost many or all of their teeth. Difficult or clumsy extractions may lead to severe changes in the alveolar remnants, thus bringing about abnormal pressure and constriction of the minute nerve terminals. Having eliminated the mouth, the nose and its accessory sinuses must be carefully investigated. The pain from an inflamed maxillary antrum frequently simulates typical toothache, usually felt in the first maxillary permanent molar.

Six months ago I was asked to investigate a case of long-standing and severe trigeminal neuralgia. The teeth still present in the mouth were alive and sound. An X-ray picture revealed the apex of the left upper canine tooth buried high up in the anterior wall of the antrum. The case gave a history of difficult extraction in this region many years before. I dissected up the labial sulcus and managed to remove the tooth apex without opening the antrum. The neuralgia disappeared three days after the operation, and has not returned.

*Morbid conditions of the eye* are occasionally met with where pain is referred to the dentition.

In cases of *organic disease of the fifth nerve* from tumour involvement the pain may be local or radiating and at times paroxysmal, as in *tic douloureux*. As distinct from that condition, however, sensation is usually lost over the area to which the affected branch is distributed. When considering the cause of pain in the distribution of the fifth nerve the possibility must not be overlooked that the source of trouble may be central, and the pain a symptom of tumour of the brain involving the root or ganglion before any signs of paresis or anaesthesia appear.

Lastly one turns to a consideration of the *systemic conditions* that may in certain cases bring about trigeminal neuralgia. The anemias (primary and secondary), rheumatism, gout, syphilis, diabetes, malaria, influenza, and perhaps pregnancy, are all mentioned as possible causations. The blood is probably charged with toxins which may in some cases accentuate slight lesions of the teeth. Many of these patients, however, may have actual foci of infection in their mouths. In the case of syphilis, a pachymeningitis may simulate neuralgia very closely—here the condition readily responds to appropriate treatment. According to Leon Harris, of New York, among the more unusual and recently studied diseases giving rise to trigeminal neuralgia is encephalitis lethargica (sleepy sickness).

**Summary.**—In summing up one recognizes that toothache covers a wide field. Diagnosis is arrived at by a process of elimination. Acute dental lesions are usually obvious. Broken teeth, teeth showing attrition, ulcerations of the mucous membrane, early pyorrhœa, food packing in late pyorrhœa, septic sockets following extractions, missing teeth, abnormal swellings round the jaws, etc., should be noted. It is the dental surgeon's province to carry out a detailed dental examination and to report to the medical man. In doubtful and difficult cases this report is not complete without X-ray pictures and possibly transillumination and pulp tests.

Having eliminated the mouth, the nose, and the sinuses, the eye and systemic conditions should be thoroughly investigated.

## TREATMENT.

Before the medical man sends the case to the dentist he may find the following temporary measures helpful.

1. In acute pulpitis following caries, a wisp of cotton-wool soaked in **Carbolic Acid**, or preferably **Carbolized Resin**, should be carefully placed in the cavity.

2. In acute periodontitis with abscess formation an incision under nitrous oxide or ethyl chloride spray is indicated.

3. Septic sockets following tooth extraction should be syringed out with a warm and mild antiseptic. **Carbolic Acid**, 50 per cent, with **Oil of Cloves** on a wisp of cotton-wool, or as an alternative a paste of **Aspirin**, can then be placed in the sockets.

In all pain of dental origin the following applications to the gum are useful: **Tinct. Iodi Mitis** and **Tinct. Aconiti** or **Chloral Hydras** and **Camphor** in equal parts, or a small '**Capsicum Plaster**' specially made for the purpose. Before applying any of these counter-irritants care should be taken to dry the surface. Apart from appropriate treatment for systemic conditions such as malaria, syphilis, etc., a large number of sedative drugs are in use. In acute cases I recommend the use of **Aspirin**, **Phenacetin**, and **Pyramidon**, 5 gr. each, taken as a powder dissolved in water, every four hours. Among the newer proprietary preparations **Veramon** and **Allonal** are popular; control of dosage, particularly with the latter, is very important.

**DERMATITIS VENENATA.** *A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.*

**Paraphenyldiamine.**—M. S. Thomson<sup>1</sup> records two cases of acute dermatitis in the axillæ, both occurring in women, which appeared to be due to wearing frocks dyed with paraphenyldiamine.

**Quinine.**—J. F. Burgess and B. Usher<sup>2</sup> describe a number of cases of dermatitis occurring on the face in patients who used a special 'after-shave' lotion. This was made up with alcohol, and, according to Canadian law, quinine was used as a denaturant. The eruption could be reproduced clinically by re-application of the quinine alcohol. Experiments showed that the affected persons were not for the most part otherwise sensitive to quinine. It therefore appeared that they had acquired a local sensitiveness to the drug.

REFERENCES.—<sup>1</sup>*Brit. Jour. Dermatol. and Syph.* 1930, Oct., 449; <sup>2</sup>*Canad. Med. Jour.* 1930, July, 45.

**DIABETES.** (*See also* HYPERINSULINISM AND HYPOGLYCEMIA.)

*John H. Anderson, M.D.*

The recent literature of diabetes mellitus deals with analyses of detail or re-examination of prevalent theories rather than with any fresh advance in knowledge of the pathology of the disease or in the methods of treatment. In the following review those divisions of the subject which have been dealt with at length in recent volumes of the MEDICAL ANNUAL are omitted or discussed briefly.

## ETIOLOGY.

**Sex.**—L. F. C. Wendt and F. B. Peck<sup>1</sup> found, contrary to general experience, a preponderance of females in a series of one thousand cases (M. 35 per cent, F. 65 per cent). Below the age of 30, the males were in a majority, but between 40 and 60 there were only 148 of them as against 388 females; this may be due to more frequent obesity in women at that age.

**Heredity.**—S. Kennedy<sup>2</sup> has surveyed the literature on heredity in diabetes. He accepts as normal a familial tendency in about 25 per cent of cases, though figures as high as 40 per cent have been reported. The laws governing the

transmission of diabetes are unknown, but Cammidge considers that the diabetic tendency is handed down in some cases as a dominant and in others as a recessive Mendelian characteristic. In the latter case the tendency may pass through healthy carriers. He also holds that "diabetes is more likely to be grave and to appear earlier in each generation when it is transmitted as a recessive characteristic, and to be mild and to appear later when it is transmitted as a dominant", i.e., when the affected person is the child of a diabetic parent. Clinical experience supports this.

*Predisposing Causes.*—C. A. Mills<sup>3</sup> suggests that regions possessing changeable and stimulating climates show a higher incidence of diabetes. He divided the United States of America into three zones, Northern, Middle, and Southern, and found a proportionate death-rate of 23:20:14. If racial factors are eliminated, the variation is even more striking. Thus the mortality among negroes increased steadily on passing northwards, away from their normal tropical environment. In Europe, if Ireland is omitted, the countries above the fiftieth parallel whose statistics are available have a higher death-rate than those below this parallel. Similarly in Australia, Tasmania, and New Zealand, the increase is towards the south—that is, away from the equator.

In J. J. R. Macleod's experience, apart from hereditary tendency and infections of the pancreas, the three main predisposing conditions are overeating, obesity, and nerve strain.<sup>4</sup> In a large series<sup>1</sup> the chief onset factors, in order of frequency, were obesity (20 per cent of cases were overweight for height), acute infections, heredity, and physical or mental strain.

The close association of diabetes and infections is well known. E. Downie<sup>5</sup> refers to the work of Labbé and Boulin, showing that even in non-diabetics there is some disturbance of carbohydrate metabolism during an acute infection. He has confirmed this by animal experiments and by observation of his own cases. No adequate explanation has as yet been advanced, and it is in doubt whether pancreas, liver, or adrenal gland is most concerned.

As regards other immediate causes, suggestions are made by J. A. Buchanan<sup>6</sup> and G. H. Tuttle<sup>7</sup>. The former, having found a yeast in the saliva of twenty-five diabetic patients, suggests that that organism produces fermentation in the intestine, the products of which disturb the oxidation mechanism of the liver, with a loss of storing power. One product is ethyl alcohol, and in his opinion the nervous phenomena in diabetes are the results of an alcoholic neuritis. We are not aware that diabetes or peripheral neuritis are known to follow the medicinal use of yeast. Tuttle, following Macleod's hypotheses (*see below*) that the pouring out of insulin follows a stimulation of the pancreas through filaments of the right vagus and that a rising blood-sugar stimulates a sugar centre situated in the vagal nucleus, suggests that "many primary diabetic states are caused by partial, or complete, paralysis of the nerve filaments connecting the sugar centre with the islands of Langerhans." He thinks that such paralysis might be caused by continued over-stimulation from overfeeding and a consistently high blood-sugar. The theory is ingenious and he fits it in with observed clinical conditions; mild cases corresponding to nerve fatigue, moderate cases to a paralysis which may recover with rest, severe cases to a paralysis without hope of recovery. It seems to us that these states can be as well explained by a direct effect of fatigue, etc., on the pancreatic islets as on the sugar centre or the nerve filaments.

Macleod considers it most unlikely that in human diabetes over-stimulation of the islets through the vagus could lead to a breakdown of their insulin-producing function. C. H. Best<sup>8</sup> agrees that the glucose concentration of the blood is the chief agent in the control of the liberation of insulin from the pancreas, but thinks that the nervous mechanism outlined above is of

secondary importance in such control, and that there is another mechanism involved. Tuttle's theory also runs counter to the opinion that whilst diabetes is more common in the well-fed, the excessive ingestion of carbohydrates has no demonstrable influence on its incidence.

#### MORBID ANATOMY.

*Pancreas.*—Acute interstitial pancreatitis is an uncommon lesion in patients dying of diabetes. A. G. Foord and B. D. Bowen<sup>9</sup> report two cases in young adults who died within thirty-six hours of the sudden onset of diabetic coma, and in whom that lesion was the only one found at autopsy. They refer to two similar cases in the literature. In coma, abdominal pain and leucocytosis are often present, and have been ascribed to pancreatitis. This is unlikely, as both vanish rapidly under adequate treatment, and in fatal cases the pancreas is, as just stated, seldom found inflamed.

#### COMPLICATIONS.

*Liver Derangement.*—Hepatic dysfunction is frequently found in diabetes. In a series of 100 cases reviewed by E. L. Meyer,<sup>10</sup> 39 showed evidence of liver derangement by the tests employed, 13 were doubtful, while 48 were normal to clinical and laboratory examination. The older the patient and the longer the disease remains uncontrolled, the more frequently liver disorder was present. Modern treatment improves the hepatic function of diabetics.

*Arteriosclerosis.*—I. M. Rabinowitch<sup>11</sup> considers that in diabetics, owing to the tendency to lipæmia, the capillaries are exposed to a colloidal pressure greater than normal. The force required to overcome this would also be increased, and it is suggested that this is the cause of cardiovascular disease. This contention is not, however, generally accepted, and most authorities hold that other factors are in play.

*Gastric Subacidity.*—It is known that gastric acidity is often low in diabetes. In a series of 100 cases I. M. Rabinowitch, A. F. Fowler, and B. A. Watson<sup>12</sup> found in 39 absence of free hydrochloric acid, and in more than 50 there was subacidity.

*Pernicious Anæmia.*—H. F. Root<sup>13</sup> has collected from the literature and other sources forty-eight cases of pernicious anæmia with diabetes mellitus. In most the latter showed itself first. The fact that achlorhydria is often found in diabetics, is suggested as an etiological factor. Root has had good results with insulin, combined with liver in some form, and a diet well supplied with vitamins. He considers that this combination is on the increase, and suggests as a reason the longer duration of life in the two diseases owing to improved methods of treatment.

*Pulmonary Tuberculosis.*—R. Fitz<sup>14</sup> mentions that as far back as 1694 Richard Morton recognized tuberculosis as a complication of diabetes. Its serious nature is well known, and is illustrated by a study of the first thousand cases of diabetes admitted to the Mayo Clinic after insulin became available. A review of this series four years later showed that of cases admitted with marked ketosis 34 per cent were dead, of those with gangrene 64 per cent, and of the group with phthisis 70 per cent. The disease is now uncommon, especially in well-treated cases; the combination of the figures of a number of observers shows an incidence of approximately 1.6 per cent. Factors which favour the development of pulmonary tuberculosis in diabetes are poverty and indoor sedentary work with lack of steady supervision, whilst direct contact or a familial tendency to either diabetes or tuberculosis do not appear of striking importance. Hilum infiltration, as seen by X rays, is one of the earliest manifestations of the lung infection, followed in a short time by the

common physical signs of phthisis. A rapid loss of weight should always arouse suspicion. The prognosis is bad; thus of 35 cases seen by Fitz between October, 1922, and January, 1929, 30 had died at the time of reporting. The acute cases have the worst outlook; when an obsolete pulmonary lesion has again become active the prognosis is said to be better. Fitz could "discover no reason for thinking that insulin was in any way harmful as a therapeutic agent."

*Skin Lesions.*—Gangrene is frequently a contributory factor in fatal cases. Joslin found it so in 24 per cent, Rabinowitch in 16 per cent, and D. W. Kramer<sup>15</sup> in 39 per cent. It is especially important that the early signs should be recognized, as we have known appropriate treatment prolong life and the health of the foot for many years. A careful history is essential; cramps in the legs, numbness, coldness and pain in the feet should arouse suspicion. On inspection and palpation the following points should be kept in mind: pallor, especially when the feet are dependent, coldness, the condition of the veins, the character of the pulse, the state of the dorsalis pedis artery and the presence of any trophic disturbances. In addition Kramer described a number of local lesions which he divides into rose spots, scar areas, blisters, and focal gangrenes, which he regards of diagnostic importance. The rose spots resemble those of typhoid fever, are discrete, vary from one to five in number, are generally slightly raised, sometimes feel nodular, and are not tender or painful. The scars or scar areas are pallid depressions with a punched-out appearance and with smooth edges, resembling the pock marks of small-pox; if small they are round, and when larger are oval or elliptical. The blisters come up rapidly, and cyanotic discoloration soon appears. Focal gangrene is seen as small black areas and requires no further description.

*Sepsis.*—As a rule sepsis is accompanied by a loss of sugar tolerance and more insulin is needed. R. D. Lawrence and R. A. McCance<sup>16</sup> report an unusual case of septicemia in a diabetic, in whom the insulin requirements, after an initial increase, became less as the sepsis grew worse with a falling temperature and failure of reactive powers. They suggest that the inhibition of insulin action is not directly due to the sepsis or toxins, but to the accompanying febrile reaction; and that usually there is increased activity of the adrenal and thyroid glands, recognized antagonists to insulin. In this case it is presumed that as these glands failed, the antagonism to insulin was removed and the dose required became less, in spite of increasing sepsis.

*Pregnancy.*—Pregnancy in diabetic women is fully discussed in the MEDICAL ANNUAL, 1930 (pp. 154 and 428), and is not as unusual as is often thought. It is still a serious complication, though the mortality is much reduced from that of pre-insulin days, when it was, through coma, over 25 per cent. In the interests of both mother and child pregnancy is inadvisable. If it does occur it demands unceasing vigilance on the part of the medical attendant. Carbohydrate tolerance generally decreases in the early stages and then recovers greatly as term is approached. It is suggested that the improvement may be because fetal insulin helps the diabetic mother, or that the carbohydrate needs of the growing child are so great as to leave but little for the maternal pancreas to deal with; or, thirdly, that improvement in the health at this stage may benefit the pancreatic function of the mother.

(In three depancreatized dogs, J. J. R. Macleod<sup>1</sup> did not find much change in the amount of insulin required during pregnancy. He points out that in these animals the whole pancreas had been removed, whereas in human pregnancy some islet tissue is still present, which may be stimulated to produce more insulin. Lactation in one of the dogs, as in a diabetic woman, was accompanied by an increased tolerance.)

Some cases are allowed to proceed to term in the normal way; other accoucheurs prefer Cæsarean section, which also permits sterilization. After delivery the tolerance may improve or deteriorate, and especial care must be taken for some months. It is a great help if the concluding stages of the pregnancy can take place in conditions which allow of blood-sugar estimations and accurate diet. When lactation is allowed there is often an increase in tolerance, probably due to the loss of carbohydrate in the milk. A case at Ruthin Castle followed much the above lines. Within a few weeks of conception the daily insulin had to be increased from 60 to 100 units, without change in diet. Tolerance began to improve about a month before term, and a week before delivery the patient was taking an extra 30 grm. of carbohydrate daily and 25 units less of insulin. Delivery was normal, and in the week following, though the blood-sugar was irregular, it was rarely over 0.19 per cent. When seen six months later both child and mother were well, the latter now back to 60 units of insulin a day.

#### CAUSES OF DEATH.

In a series of 150 deaths, of which 57 per cent were in females, D. M. and R. M. M. Lyon,<sup>17</sup> excluding coma, which they classify as a secondary and not as a primary cause of death (and which was present in 39 per cent), grouped the cases as follows: Cardiovascular disease 29 per cent, various infections 25 per cent, improper treatment 14 per cent, cancer 9 per cent, tuberculosis 7 per cent, acute non-surgical abdominal conditions 6 per cent, miscellaneous 10 per cent. In the earlier years of life, almost all cases developed coma before death, whilst in later years this tendency diminished. It is suggested, therefore, that cases of diabetes may be divided into: (1) A 'toxic type', in young people, with a tendency to coma; and (2) A 'degenerative type', characterized by greater age, arteriosclerosis, and obesity. Treatment should be directed accordingly: in the young to avoid ketosis, and in the older to protect the vascular system. These authors make no mention of the common experience of shock, strain, or any sudden change as an immediate cause of coma in severe unstabilized diabetes. With regard to improper treatment as a cause of death, many lives are lost because insulin, with appropriate diet, is not given.<sup>8</sup> Extended reference has already been made to the incidence of tuberculosis and gangrene in fatal cases.

#### TREATMENT.

F. M. Allen<sup>18</sup> succinctly states the principles of treatment as follows: If diabetes is a deficiency of insulin, logical treatment consists in (1) reducing the need for insulin by dietary restrictions, (2) giving additional insulin as may be necessary.

**Diet.**—"The importance of suitable dietetic measures is not lessened by the introduction of insulin, but rather increased" (MEDICAL ANNUAL, 1924, p. 119). The final diet is one which ensures comfort and maintains strength with a body weight either at normal, or 5 to 10 lb. below the average normal. This can only be obtained by working out the individual needs of each patient, and calls for care and supervision on the part of the doctor, coupled with intelligent co-operation and straight dealing on the part of the patient.<sup>18</sup> N. B. Foster<sup>19</sup> also pleads for the treatment of the patient rather than the disease, and feels that the diet should be adjusted to the 'optimum weight' of the patient, insulin being used if necessary. M. O. Raven<sup>20</sup> stresses the general finding that routine dietary treatment over a prolonged period often leads to an increase in tolerance. In treatment E. I. Spriggs<sup>21</sup> divides his patients into: (1) Mild cases requiring restriction of carbohydrate only; (2) More

severe cases, (a) requiring a measured diet with or without 'fasting', (b) requiring insulin. In the mild cases the greatest amount of carbohydrate the patient can take with a sugar-free urine is ascertained, and three-quarters of this amount is given six days a week, with a reduced carbohydrate intake on the seventh day. Of the more severe cases there are still some who benefit, at the beginning of treatment, from a day or two's 'fluid diet' or so-called 'fasting'. On such a day clear meat soup, weak tea, with skim milk but no sugar, and water are allowed, and the patient should rest, not necessarily in bed. Food is then gradually added on the 'ladder' system, the amount of carbohydrate being kept low till the patient's response is seen. About 200 calories are given the first day, 400 the second, and, if all goes well and the urine remains sugar-free, the thousand-calorie mark is reached about the sixth day. It is sometimes necessary to halt a day or so on one diet or even to retrace a couple of steps if sugar appears. Step by step the diet is increased till the limit required is reached.

The building up of the diet is governed by two factors. In the first place it must be properly balanced—that is, contain certain proportions of carbohydrate, protein, and fat. Secondly, it must be adequate in amount having regard to the size of the patient. Spriggs uses a proportion of C. : P. : F. as 1 :  $1\frac{1}{2}$  : 3, and in adults tries to reach P.  $\frac{3}{4}$  – 1 gm. (30 gm. = 1 oz.) to each kilo. of body weight (1 kilo. =  $2\frac{1}{2}$  lb.). Expressed another way, this gives 20 to 25 calories per kilo. of body weight. In children a higher caloric value is required to provide for growth and to counteract the greater cooling surface in proportion to body weight. Where ketosis is definite the preliminary fast and early stages of the ladder diet may be badly borne and coma may threaten. In such the 'basal ration' or 'maintenance diet' may be adopted. In this the patient is given at once a diet in which carbohydrate and fat are carefully balanced and whose caloric value is about one-half the normal for the patient's weight and age. The proportion of C., P., and F. is expressed in the equation  $F. = 2 C. + \frac{1}{2} P.$

This careful balancing of various constituents of the diet, which is so beneficial in all diabetes, is to prevent ketosis, which occurs when the supply or metabolism of carbohydrates is inadequate. Each 1 gm. of carbohydrate produces 1 gm. of sugar which is antiketogenic and no ketogenic substances. Similarly each 1 gm. of protein produces 0.58 gm. of antiketogenic and 0.46 gm. of ketogenic substances, and each 1 gm. of fat produces 0.1 gm. of antiketogenic and 0.9 gm. of ketogenic products. When the ratio of ketogenic to antiketogenic substances exceeds a certain figure acetone bodies appear in the urine. Woodyatt, assuming Shaffer's ratio of 1.5 to 1, calculated that acetonuria "would not occur so long as the total fat metabolized did not exceed twice the amount of carbohydrate plus half the amount of protein", and hence the equation  $F. = 2 C. + \frac{1}{2} P.$ <sup>22</sup> The caloric value of the maintenance diet is readily obtained by the use of tables (Boothby & Sandiford and the Aub-Du Bois), which take into account the sex, age, height, and weight of the patient.

G. Graham<sup>23</sup> prefers the preliminary fast and ladder diet to the maintenance diet, because on the former symptoms are relieved at once. Further, it has a psychological effect, as every addition is appreciated, and, lastly, the fast day keeps the patient at rest and makes him appreciate the seriousness of his condition. He takes three to four weeks for the preliminary treatment, which gives the pancreas a chance to recover and enables the patient to learn the details of his diet. After the fast, eggs, butter, cream, and vegetables are given, followed later by meat, fish, bacon, milk, and fruit, in that order. The level reached with this diet is nearly the same as the

maintenance diet, but the carbohydrate allowance is a little lower. The carbohydrate is then cautiously increased each week until it reaches 40 gm. In each of the dietary systems outlined above, the necessary details as to caloric values of food, their proportions of C., P., and F., and their alternatives are obtained from one of the many available diet tables.

To save time and trouble in calculating, various schemes of 'rations' and 'half rations' have been devised. One of the best is the 'line ration' introduced by R. D. Lawrence. In this scheme various combinations of foods by weight are arranged so that each 'line ration' has a food value of 190 calories and is in the proportion C. 5 gm., P.  $7\frac{1}{2}$  gm., and F. 15 gm. In addition the selection is so skilfully made that the carbohydrate moiety of one ration may be changed with its corresponding number in another ration without altering the caloric value or the C., P., and F. ratio. To calculate the number of line rations for a day's diet the patient's stripped weight in pounds is divided by 16.5—for example, patient's stripped weight 11 st. 11 lb. = 165 lb.;  $165 \div 16.5 = 10$ ; then the daily allowance is ten 'line rations'. These are then distributed between the various meals of the day. Full details of this method can be found in most diabetic manuals and in Lawrence's book, *The Diabetic Life*.

By any of the schemes set out above a scale of diet is at length reached which conforms on theoretical grounds to the requirements of the patient. The final stage, and a very important one, is the adjustment to the individual needs and wishes. "The test of whether the diet is adequate is the weighing machine, and the patient should be weighed each week."<sup>23</sup> The diet should be as varied as possible; carbohydrate is best given as milk, fruit, and vegetables; protein as meat, fish, eggs, and cheese; and fat as cream and butter. Special diabetic foods should be regarded with suspicion, unless their composition is known; we have found 'Allenburys' diabetic flour and Callard's special preparations satisfactory.<sup>21</sup> If tolerance breaks down before an adequate diet is reached—that is, a diet which maintains body weight, comfort, and efficiency with a blood-sugar within normal limits, and a urine free from sugar and acetone bodies—or if a reasonable amount of carbohydrate, say 40 to 50 gm., cannot be metabolized daily, insulin is needed.

It must be clearly recognized that insulin is an adjuvant and does not replace dieting. Its use permits of an increase of carbohydrate and a corresponding reduction of fat in the diet, and so lessens the liability to ketosis. The diet can be made more palatable, and, as strictness in diet is essential, the more the patient likes and enjoys his meals the less liable he is to eat unauthorized foods.

"It seems not unlikely that we shall use a larger amount of carbohydrate in diabetic diets of the future since we have insulin to metabolize it" (MEDICAL ANNUAL, 1931, p. 140). This is already being done by some workers. N. B. Foster<sup>19</sup> favours a high carbohydrate diet, particularly in the presence of arteriosclerosis. I. M. Rabinowitch<sup>24</sup> found a general improvement to follow the institution of a high-carbohydrate-low-caloric diet, in which the fats are reduced. He aims at keeping the patient 5 to 10 lb. under the normal body weight, and in a series of 10 cases was able to reduce the amount of insulin in 7, after the change had been made from the 'old diet' to the 'new'. An example of an 'old diet' is C. 50, P. 50, F. 150 (1750 calories), and the same patient under the 'new diet' would receive 1736 calories made up of C. 236, P. 72, F. 56. The obvious question is whether this happy state of affairs will continue. We have all seen patients stand up for a time to a great increase of carbohydrate in diet, but often there is a reaction, and a long climb back is needed before stability is regained. The experience of several workers is



that the increase of carbohydrate and lessening of the fat should not be pushed as far as the above figures; in addition a great deal depends on the severity of the case. We agree with Rabinowitch that "further experiences are necessary in order to determine the permanency of the effects of these diets." J. J. Short<sup>25</sup> has had a longer experience of this type of diet, and in his hands "the benefits seen have greatly exceeded expectations." He publishes a set of diets with a caloric value ranging from 910 to 2831, with the rates C. : P. : F. = 3 : 1 : 1½. Details of results are reserved for a later communication and should prove of interest.

In every case of diabetes the intelligent co-operation of the patient is essential. An hour's talk on elementary physiology is of great value and obviates much future trouble to both doctor and patient. The grasp most patients show of their condition is considerable, and they can easily be taught to test their own urine and keep useful records of the results. Regular supervision should be insisted on, and the patient taught to seek advice at the first sign of anything unusual.

#### **Insulin.**—

*Regulation of Secretion.*—The Toronto School has done much good work upon experimental diabetes in animals, and J. J. R. Macleod<sup>4</sup> chose as his title for the Oliver Sharpey Lectures of 1930, "Diabetes as a Physiological Problem". He points out that "the internal secretion of insulin must be adjusted from time to time according to the needs of the organism, and it is probably safe to assume that a greater secretion will be required when pre-formed carbohydrates, rather than protein and fat, are the food stuffs being assimilated." It has been shown that if the pancreas is strongly stimulated to secrete insulin, peculiar changes of a degenerative nature become visible in the cells of the islets. On giving insulin, these changes disappear and the cells revert to their normal condition. Again, if sugar is given, the islets are stimulated by the increased concentration of sugar in the blood, and it has been shown in healthy human subjects that a greater fall of blood-sugar follows small doses of insulin plus glucose than after the same amount of insulin alone, the glucose acting as a spur to the secreting mechanism of the pancreas. Branches of the right vagus nerve are in close anatomical relation with the islets, and it is known that stimulation of the vagus causes an increased secretion of insulin. Cross-circulation experiments "would appear to demonstrate beyond all doubt that the secretory activity of the islets is under the control of the vagus centre, and that this is stimulated by an increased concentration of glucose in the blood."<sup>4</sup> Macleod then considers the possibility of a chemical control as well, particularly a thyroid hormone one, and after reviewing the available evidence concludes "that the answer to our main question, whether changes in the glucose concentration of the blood affect the islets directly or indirectly, either through hormones from other glands or by nervous control, cannot as yet be expected to be a final one."

*Hypoglycæmia.*—In the Oliver Sharpey lectures in 1926, H. MacLean drew attention to the danger arising from hypoglycæmia, following over-doses of insulin, to patients with degeneration of the cardiac muscle. W. S. Middleton and W. H. Outway, jun.<sup>26</sup> recall the old observation that in diabetes, the inability of the tissues to utilize glucose is shared by the heart in common with other muscle tissue. The frequent presence of arteriosclerosis in diabetes increases the strain on the myocardium, even if no organic cardiac disease can be demonstrated. In proof of this they took electrocardiographic tracings in a series of cases during a period of post-insulin hypoglycæmia (i.e., blood-sugar below 0.07 per cent) and again when the blood-sugar was within normal limits. During hypoglycæmia the T waves were depressed and in less degree

the P waves also. About half the cases showed an increase in the A-V conduction time and a fall in blood-pressure. The increase in the conduction-rate and fall in the systolic blood-pressure was more in those over forty years of age. The practical issue is that care should be taken to avoid hypoglycæmia in all cases, but particularly in the presence of myocardial change.

*Insulin Œdema.*—Isolated cases have been reported of a generalized transient œdema following the institution of insulin therapy. A woman seen by I. H. Marcus<sup>27</sup> with glycosuria and ketonuria showed œdema of the legs on the fifth day of insulin, spreading later to thighs and eyelids, and lasting ten days. Marcus discusses the condition and is at a loss as to the cause and even whether it is due to the use of insulin. Campbell and Macleod consider the phrase 'insulin œdema' a misnomer. Suggested causes are previous under-nutrition, excessive fluid intake, water retention due to insulin, with the need of extra water to balance the sudden storage of glycogen in liver and muscles, and excessive alkalinity of the blood. Each of these theories is open to objection on general as well as on specific grounds. With the cause unknown, treatment is of necessity indefinite. A salt-free diet calcium chloride by the mouth, 10 gr. of potassium acid carbonate with the same amount of potassium chloride three times a day, have all apparently yielded good results; whilst in other cases the œdema vanished spontaneously, with a corresponding increase in the volume of urine.

*Insulin Substitutes.*—The search for an oral substitute for hypodermic insulin continues, but so far without success. H. N. Makherjee<sup>28</sup> has had good results in animals with phosphotungstate of insulin orally and is now using it for human diabetics; R. D. Lawrence<sup>29</sup> found large doses of no practical value in two cases and fears its action on the kidneys. Macleod<sup>4</sup> can see no justification for the use of synthalin or myrtilin. In the hands of W. W. Ingram and G. V. Rudd<sup>30</sup> a preparation of myrtilin made from 'prickly pear' (*Opuntia emermis*) had no effect on urinary or blood sugar. Watery extracts of liver have been said to act similarly to insulin; R. D. Lawrence<sup>31</sup> in humans, and P. C. Brett, W. A. Broom, and E. O. Howitt<sup>32</sup> in animals, were unable to recognize any such action. R. Stephan<sup>33</sup> claims good results with cholsulin (an addition compound of insulin with the sodium salt of desoxycholic acid), but F. Umber and M. Rosenberg<sup>34</sup> consider it of no practical value.

*General Results of Insulin Treatment.*—B. D. Bowen<sup>35</sup> has made an interesting analysis of the effect of insulin treatment from the standpoint of the patient's total reaction, mental and physical, to his environment. From this it appears that the adult diabetic under insulin treatment compares quite favourably with the normal individual. About half, however, stated that whilst they could exert themselves as much as ever for a short time, long-continued effort produced undue fatigue. This physical limitation was not noticed in children. "Early recognition and adequate treatment are the most important factors in obtaining good results." Many patients have an aversion to the thought of insulin which requires great patience on the part of the physician to overcome. Often, as mentioned by E. I. Spriggs,<sup>21</sup> consent may be obtained for a fortnight's trial, without prejudice on either side. Such a trial generally produces a change of attitude to the injection, particularly if it is possible to add to the diet, during the probationary period, some desired but hitherto forbidden dish. If the pain which sometimes follows the injection persists, the brand of insulin should be changed, since a particular product which suits one case may cause local disturbance in another. In one instance local reaction took place till a Danish preparation was used (G. Graham, personal communication). Insulin may be stopped at any time, and, unless

the disease has progressed rapidly, the position is no worse than before it was used, sometimes in milder cases the tolerance has improved. The effect of exercise should be made clear to the patient; if moderate, it generally improves carbohydrate tolerance, and less insulin may be needed. If severe and exhausting, it can produce a lowering of the rate of sugar metabolism with a rapid hyperglycemia. Every person taking insulin should carry some carbohydrate till the position as to diet, etc., is stabilized. A couple of lumps of loaf sugar in the waistcoat pocket or handbag is a convenient way of doing this.

Patients can be, and are, trained in the use of insulin in private practice, though the first stabilization should always, if possible, be carried out under laboratory control.

#### MORTALITY RATE.

Though the disease has been scientifically mastered, statistically there has been no fall in the death-rate.<sup>18</sup> Under 19 years of age there is a marked drop, and over 40 the rate is rising, mainly from arteriosclerosis.<sup>1</sup> These statements by American observers require some explanation. More frequent diagnosis of the disease, especially in older people, from more routine examinations of the urine, may increase the statistical death-rate. Factors suggested as contributing to the mortality, such as disobedience on the part of the patient, failure by the physician to recognize the seriousness of the disease in its earlier stages,<sup>18</sup> and that cases which insulin might benefit are not receiving it,<sup>8</sup> were previously more operative than now. It is, moreover, a matter of experience that in hospitals where deaths from diabetes were common in pre-insulin days, they are now rare.

#### RENAL GLYCOSURIA.

K. Eisenbud<sup>36</sup> defines renal glycosuria as a condition of glycosuria not associated with hyperglycemia and not caused by an endocrine disturbance. Two theories of causation are: (1) That there is damage to kidney tubules; and (2) That whereas normally glucose exists in the blood in combination with a colloid, in renal glycosuria a part is present as free glucose, and, in consequence, is not held back by the kidneys. The differentiation from diabetes mellitus is made by means of the sugar-tolerance test. In his opinion, even though there is no relation between the two glycosurias, patients should be put on a diet containing not more than 120 gm. of carbohydrate per diem and carefully watched. Other observers, including ourselves, agree with H. C. Powelson and R. M. Wildes,<sup>37</sup> who, after a study of ninety-one cases of benign glycosuria, consider that these cases do badly on a diabetic régime. They prefer the term 'normoglycemic glycosuria', and often found a familial tendency. They describe as 'diabetes innocens' a rare condition with a normal or low fasting blood-sugar, a sugar-tolerance curve which is the same as that seen in diabetes mellitus, a low renal threshold, and none of the other signs or symptoms of true diabetes. Alimentary hyperglycemia they regard as due to a slow mobilization of the mechanism for storing sugar. The glycosuria of pregnancy is as a rule of the normoglycemic type, but may pass into the more sinister form. Sapræmic glycosuria is sometimes seen in toxic conditions, and clears with the removal of the infection.

Every case of glycosuria should be regarded with grave suspicion till it is proved to be innocent. Careful and prolonged observation with frequent examinations of blood and urine may be necessary before this can be done. A blood-sugar tolerance test is of the greatest help.

## DIABETIC 'COLIC', OR THE PSEUDO-ACUTE ABDOMEN OF KETOSIS.

A report by R. D. Lawrence, C. G. Millman, and F. E. Pilkinton<sup>38</sup> illustrates the difficulty of differentiating, in a few rare cases, between an acute abdomen in a known diabetic and the pseudo-acute abdomen of severe ketosis. A young man was seen in a hypoglycæmic attack on March 14 and, with treatment, was well on March 16. The next afternoon he returned, and his condition suggested four possible causes: (1) Diaphragmatic pleurisy; (2) A tabetic gastric crisis; (3) An acute abdominal catastrophe; or (4) Severe 'diabetic colic'. The first two were eliminated, but it was difficult to decide if the case was medical or surgical. In view of the severe ketosis and hyperglycæmia insulin was pushed, and fifteen hours later the diagnosis of 'diabetic colic' was assured by the disappearance of symptoms. This was then "an extreme case of the acute abdominal condition occasionally associated with severe diabetic ketosis. Intense abdominal pain, tenderness and rigidity, and a high leucocytosis were present, simulating an acute abdominal condition." A. T. Bazin suggests that in an acute abdominal lesion the pain precedes the vomiting and the reverse is the case in the diabetic pseudo-acute abdomen. Moreover in 'diabetic colic' the abdominal signs are indefinite and diffuse, and disproportionate to the constitutional disturbance.<sup>39</sup>

## DIABETIC COMA.

W. R. Campbell reviewed diabetic coma in the 1931 ANNUAL (p. 142). We agree with him that a hospital is the best place for its treatment, but surely his dictum that "coma can be abolished by the practitioner" requires to be qualified by the words "with the co-operation of the patient". The last case seen at Ruthin Castle was doing well on insulin, ordered and controlled by his family doctor, but abandoned the injections in favour of spine manipulations by a bone-setter. The resulting coma could not in any way be attributed to the doctor, but rather to the credulity and ignorance of the patient.

R. D. Lawrence<sup>40</sup> divides the chemical findings in the blood of severe coma into two groups: (1) The diabetic state, with hyperglycæmia, excess of ketone bodies and low alkali reserve; and (2) A state of dehydration. In the latter, tissue depletion is shown by the low tension of the eyeball, and the low blood-volume and pressure by a running thready pulse. The concentrated blood has a high specific gravity, hæmoglobin content, and urea, with low chlorides. The first derangement requires insulin and the second fluid. He begins with large doses of insulin (100 to 120 units) both hypodermically and intravenously, and buffers it with glucose. The early polyuria and the inability to absorb fluid in the later stages, owing to vomiting and unconsciousness, result in the dehydration, which is followed by the scanty secretion of urine and even acute anuria. Fluid should be given intravenously and in large amounts. On theoretical grounds Lawrence advocates hypertonic salt solution (1.8 per cent), but emphasizes that the quantity of the fluid is more important than its quality. Enough is given to fill visibly the shrunken tissues and to re-establish the volume of the pulse. This may require three to five pints or even more. One patient received over nine pints in eighteen hours. He then injects gum acacia solution (7 per cent) on the ground that it is more likely to remain in the circulation than the saline. Should the pulse relapse, more saline and gum solution is given. Lawrence prefers a Jubé's blood-transfusion syringe to the gravity method for intravenous injection and gives a pint in from fifteen to twenty-five minutes. When the first emergency has been overcome fluid is continued by the mouth, the rectum, or under the skin, till danger is past and the normal renal output restored. A few drops of adrenalin are added

to the first intravenous injection. Caffeine, digitalin, camphor, and other cardiac stimulants are used as needed.

#### MISCELLANEOUS.

*Ketosis and Acidosis.*—In his excellent monograph *Chemical Methods in Clinical Medicine*, G. A. Harrison<sup>22</sup> refers to the confusion which has arisen over the terms 'ketosis' and 'acidosis'. Fats, and to a much lesser degree proteins, are not properly broken down when the supply of carbohydrate is inadequate, or when, even if adequate, it cannot be properly utilized by the body. This results in the presence of abnormal amounts of acetone or ketone bodies in the blood (acetonæmia) and urine (acetonuria), and the condition is called 'ketosis'. Ketosis is seen in diabetes, also in starvation and after vomiting or anæsthesia. When the blood is more acid than normal, acidæmia or uncompensated acidosis occurs. Further, if with a normal blood reaction, the distribution of acid radicles to basic radicles is such as to cause a leaning towards an acid reaction, the term 'acidosis' or 'compensated acidosis' is used. Acidosis, therefore, gives an indication as to the reaction of the body fluids, while ketosis does not, for acetonuria can and does occur in an alkaline urine. Clinically acidosis may follow the excessive formation of acetone bodies (as in diabetes) or of other organic acids (as lactic acid in severe circulatory failure), the defective excretion of phosphates (as in chronic interstitial nephritis) or of carbonic acid (as in extensive lung disease).

*Surgery in Diabetes and Hyperinsulinism* were dealt with in last year's MEDICAL ANNUAL, pp. 146 and 143.

REFERENCES.—<sup>1</sup>*Amer. Jour. Med. Sci.* 1931, Jan., 52; <sup>2</sup>*Jour. Amer. Med. Assoc.* 1931, Jan. 24, 241; <sup>3</sup>*Arch. of Internal Med.* 1930, Oct., 569; <sup>4</sup>*Lancet*, 1930, ii, 383; *Ibid.* ii, 513; <sup>5</sup>*Med. Jour. of Australia*, 1930, June 21, 813; <sup>6</sup>*Med. Jour. and Record*, 1930, Oct. 15, 371, Nov. 5, 427; <sup>7</sup>*New Eng. Jour. Med.* 1931, May 7, 963; <sup>8</sup>*Canad. Med. Assoc. Jour.* 1930, Aug., 141; <sup>9</sup>*Amer. Jour. Med. Sci.* 1930, Nov., 676; <sup>10</sup>*Arch. of Internal Med.* 1931, Feb., 182; <sup>11</sup>*Ibid.* 1930, Nov., 752; <sup>12</sup>*Ibid.* 1931, March, 384; <sup>13</sup>*Jour. Amer. Med. Assoc.* 1931, March 21, 927; <sup>14</sup>*Amer. Jour. Med. Sci.* 1930, Aug., 191; <sup>15</sup>*Med. Jour. and Record*, 1930, Oct. 1, 338; <sup>16</sup>*Brit. Med. Jour.* 1931, i, 749; <sup>17</sup>*Lancet*, 1930, ii, 293; <sup>18</sup>*New Eng. Jour. Med.* 1930, Dec. 4, 1133; <sup>19</sup>*Jour. Amer. Med. Assoc.* 1930, June 21, 1974; <sup>20</sup>*Practitioner*, 1930, Sept., 402; <sup>21</sup>*Index of Treatment*, 1931, Bristol, John Wright & Sons, Ltd.; <sup>22</sup>*Chemical Methods in Clinical Medicine*, 1930, London, J. & A. Churchill; <sup>23</sup>*Modern Technique in Treatment*, 1927, iii, London, "The Lancet"; <sup>24</sup>*Canad. Med. Assoc. Jour.* 1930, Oct., 489; <sup>25</sup>*Jour. Amer. Med. Assoc.* 1931, June 6, 1940; <sup>26</sup>*Amer. Jour. Med. Sci.* 1931, Jan., 39; <sup>27</sup>*Med. Jour. and Record*, 1931, Jan. 7, 12; <sup>28</sup>*Calcutta Med. Jour.* 1930, Oct., 157; <sup>29</sup>*Lancet*, 1931, i, 184; <sup>30</sup>*Med. Jour. of Australia*, 1930, Sept. 13, 360; <sup>31</sup>*Lancet*, 1930, ii, 1179; <sup>32</sup>*Ibid.* 1931, i, 20; <sup>33</sup>*Deut. med. Woch.* 1930, lvi, 88; <sup>34</sup>*Ibid.* 169 and 123; <sup>35</sup>*Jour. Amer. Med. Assoc.* 1930, Aug. 23, 565; <sup>36</sup>*Med. Jour. and Record*, 1930, July 16, 66; <sup>37</sup>*Jour. Amer. Med. Assoc.* 1931, May 9, 1562; <sup>38</sup>*Brit. Med. Jour.* 1931, ii, 530; <sup>39</sup>*Canad. Med. Assoc. Jour.* 1930, Aug., 146; <sup>40</sup>*Brit. Med. Jour.* 1930, i, 690.

#### DIPHTHERIA.

J. D. Rolleston, M.D., F.R.C.P.

*EPIDEMIOLOGY.*—According to the Monthly Epidemiological Report of the Health Section of the League of Nations,<sup>1</sup> the increased morbidity of diphtheria is shown by the fact that twenty-seven European countries which reported 257,959 cases in 1927, and 296,070 cases in 1928, returned 327,391 cases in 1929. The figures available for the first eight months of 1930 indicate a further rise in the number of cases. The rates of Belgium for diphtheria as for scarlet fever are remarkably low. In countries where the disease is comparatively rare, diphtheria often assumes a dangerous form, e.g., the high rates of case-mortality in Bulgaria (14.6 per cent), Roumania (16.2 per cent), and Yugo-Slavia (16.1 per cent), coincide with the strikingly low morbidity-rates of 29.0, 18.1, and 40.4 per 100,000 population.

T. S. Higgins,<sup>2</sup> Medical Officer of Health for the City of Cape Town, reports

that considerable variations in the incidence- and death-rates of diphtheria take place from year to year. The maximum seasonal variation in Cape Town is in March (autumn) and the maximum in September (spring). Schick tests show a somewhat higher percentage of susceptibles among European school children, viz., 51 per cent among 1663 aged from 6 to 15, than among New York children of the same age (50 per cent). Among 160 non-European children of the same age there were 29 per cent susceptible, the higher proportion of immunes being possibly due to a higher natural immunity. Diphtheria is not a common cause of death in Cape Town, as only 1 in every 130 deaths of Europeans and 1 in every 284 deaths of non-Europeans is due to this cause.

F. Reiche<sup>3</sup> states that the high epidemic wave of diphtheria in Hamburg during the period 1908-19, in which 52,710 cases were notified, with a mortality of 9.1 per cent, was followed by a fall in the incidence and fatality lasting until 1926 and 1927. In 1928, however, there was a rise, the notifications numbering 995, with a mortality of 6.0 per cent, as compared with 436 in 1927, with a mortality of 5.0 per cent. In 1929 there was a further rise to 1667 cases, with a mortality of 8.6 per cent. Since December, 1928, there has been a considerable increase in the number of malignant faucial cases, in contrast with the rarity of laryngeal attacks, as had been noted by other European observers. (*See MEDICAL ANNUAL*, 1919, p. 129.)

According to the Swiss Home Office,<sup>4</sup> although diphtheria is no longer such a serious disease as it used to be, it still occupies an important place in the statistics of contagious diseases. In 1920, 8346 cases were notified, and then the incidence declined until 1926 (1,930 cases), but in 1927 the number rose to 2898, in 1928 to 3193, and in 1929 (up to the end of November) to 3220. Similarly the number of fatal cases fell from 674 in 1920 to 115 in 1926, and then rose to 151 in 1927, 200 in 1928, and 134 in the first nine months of 1929. The number of cases notified was undoubtedly below the real incidence of the disease, but the number of deaths reported might be regarded as fairly correct.

H. Audeoud<sup>5</sup> states that there were more than 4000 cases of diphtheria at Geneva in 1929, with 208 deaths, so that the disease was more fatal than scarlet fever, measles, and whooping-cough combined, which caused 198 deaths.

B. Johan and J. Tomcsik<sup>6</sup> state that Hungary is one of the European countries in which the incidence and mortality of diphtheria have shown the highest rise in recent years. In 1923, 2635 cases were notified in Hungary, and the number increased every year until it reached 9402 in 1928, when the incidence of 109.3 cases to every 100,000 inhabitants was exceeded in only three European countries, viz., Denmark, Great Britain, and Austria, while the fatality was the highest (12.6 per cent).

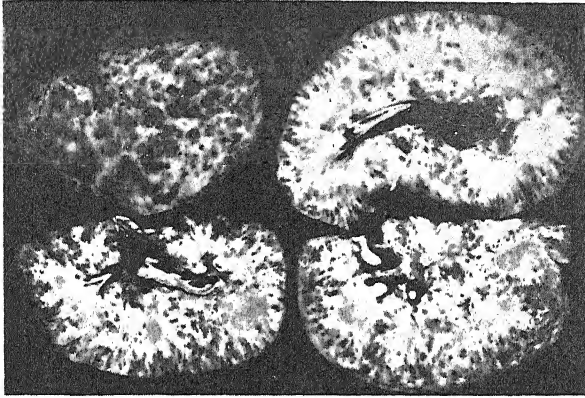
The eighth annual report of the *Journal of the American Medical Association*<sup>7</sup> on the diphtheria mortality in the ninety-three cities in the United States with a population of more than 100,000 shows a remarkable decline in the general urban death-rate for diphtheria throughout the country for 1930, when the lowest diphtheria-rate yet recorded was reached. The next decade will decide whether the reductions in mortality are due to natural fluctuations in the disease itself or whether and in what part they have been caused by preventive measures such as toxin-antitoxin and toxoid immunization.

**SYMPTOMS AND COMPLICATIONS.**—A. B. Marfan<sup>8</sup> illustrates the occurrence of diphtheria in the newborn by the fact that epidemics have been observed in maternity hospitals in Grenoble, Paris, and Bordeaux. The infection in such cases may be of obstetrical origin, the child being contaminated during delivery by diphtheria bacilli in the vaginal discharge. In other cases the child may be infected by the mother who is a carrier. Faucial diphtheria is very rare in the infant owing to the special structure of the tonsils, while the nasal

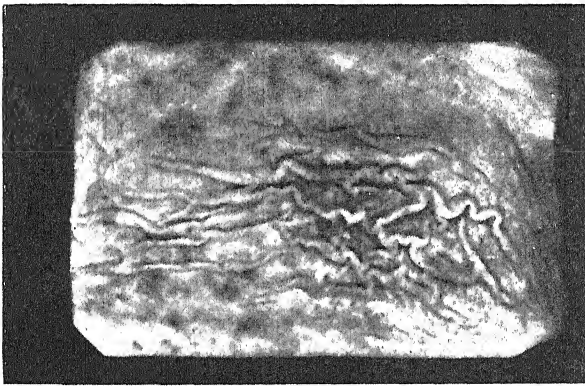
*PLATE XII*

PURPURA HÆMORRHAGICA FOLLOWING DIPHThERIA

(J. E. MCCARTNEY)



*Fig. A.*—Kidney.



*Fig. B.*—Stomach.

*By kind permission of the  
'Proceedings of the Royal Society of Medicine'*





mucosa, which is the usual site for diphtheria in the infant, is not likely to be infected as long as it is healthy, but only as a rule in those suffering from a cold, influenza, measles, or syphilis. Other localizations of diphtheria in the infant often associated with rhinitis are otitis, mastoiditis, conjunctivitis, and cutaneous diphtheria, especially of the retro-auricular region and umbilicus.

J. C. Montgomery,<sup>9</sup> who has collected 43 examples, including one of his own, divides cases of *diphtheria of the umbilicus* into the following three groups: (1) Those with no clinical evidence of infection but only positive cultures from a moist umbilicus (3 cases); (2) Those with a slight caseous deposit and positive cultures (22 cases); and (3) Those with more extensive evidence of infection (18 cases). In several instances diphtheria was found in other parts of the body, especially the nose. Montgomery's case, which occurred in a male infant, aged 3 weeks, was unique in that death took place from myocarditis and paralysis of the diaphragm. There is no other case on record of diphtheria of the umbilicus with myocarditis and nervous complications.

According to A. Stammer<sup>10</sup> *diphtheritic vulvovaginitis* is a relatively rare condition, being found chiefly in children already suffering from nasal or faucial diphtheria. In rare instances it is primary, infection having been conveyed from the sick to the healthy by the hands. The prognosis is almost always favourable, and it is only when ulceration is extensive that septicæmia is likely to occur.

H. Behdjet and O. Chereffeddin<sup>11</sup> record a case of *multiple gangrenous diphtheritic dermatitis* in a girl of 3½ years, whose brother had recently died of diphtheria. She first developed blepharitis and keratitis of the left eye, followed twenty days later by similar involvement of the right eye. A few days afterwards a sanious discharge from the nose occurred and gangrenous ulcers appeared on the lips, back of the neck, right axilla, both groins, and right index finger. There was marked cachexia. Cultures of the nasal mucosa and of the ulcers of the lips and skin showed typical diphtheria bacilli. Recovery took place after injection of antitoxin.

J. D. Rolleston and D. G. Macpherson<sup>12</sup> record a fatal case of *purpura hæmorrhagica* following diphtheria in a boy aged 4 years treated by antitoxin. The purpura, in the form of bleeding from the mouth and pharynx, and melæna, did not develop until seventeen days after the throat had become clean, and the following day petechiæ and purpuric patches appeared on the abdomen and loins as well as hæmorrhages from the mouth, pharynx, and rectum. Death took place next day, and the autopsy showed hæmorrhages in the pharynx, œsophagus, stomach, large and small intestine, kidneys, bladder, and heart (*Plate XII*). *Purpura hæmorrhagica* in convalescence from diphtheria as distinct from the acute stage is an extremely rare occurrence, only four previous examples, all of which recovered, having been recorded. It is unlikely that the antitoxin was the cause of the purpura, as none of the twenty-three other patients who had the same brand showed any evidence of purpura.

S. Butler and S. A. Levine,<sup>13</sup> in a paper on diphtheria as a cause of late *heart-block*, state that among 20 patients with proved heart-block without the usual causes, such as coronary artery disease, digitalis, fever, and rheumatic infection, 50 per cent gave a history of diphtheria in childhood as compared with only 6 per cent in 600 consecutive control surgical cases. The average age of patients with a history of diphtheria was 11 years, and their systolic blood-pressure was 40 mm. lower than in those without such a history. They conclude that diphtheria is an etiological factor in late heart-block, either by impairment of the conduction apparatus or by predisposing the heart to sclerosis, which, in the absence of diphtheria, would have occurred at a later age.

E. A. Underwood<sup>14</sup> emphasizes the rarity of ear complications and especially *mastoiditis* in diphtheria, and records the case of a boy, age 12, who on the thirty-fifth day of a severe attack of faucial and nasal diphtheria developed right purulent otorrhœa. Mastoiditis ensued on the seventy-third day, and a mastoid operation was performed on the ninety-second, when considerable erosion of the bone was found. Uncomplicated recovery took place.

Commenting on this paper, J. D. Rolleston<sup>15</sup> points out that, though decidedly less common than in scarlet fever, *otitis* is not so rare a complication of diphtheria as Underwood maintains. In the course of 1930, out of 1428 completed cases of diphtheria at the Western Hospital, 23 (1.6 per cent) developed otitis, though only one of them showed any signs of mastoiditis. According to the statistics of the M.A.B. fever hospitals the frequency of otitis in diphtheria ranged between 4.01 and 7.42 per cent during the period 1900-09.

J. Donato<sup>16</sup> states that while in an ordinary attack of diphtheria the glucose and cholesterol content of the blood serum is little affected, in severe attacks there is a considerable *diminution of glycaemia and cholesterinæmia*, which appears to be directly related to the intensity of the toxæmia. Estimation, therefore, of the glucose and cholesterol control of the serum is of value in the diagnosis and prognosis of suprarenal insufficiency, which is the chief cause of malignancy in diphtheria. On recovery hypercholesterinæmia takes place.

DIAGNOSIS.—J. E. Gordon and D. C. Young<sup>17</sup> illustrate the likelihood of malignant diphtheria being mistaken for quinsy, and the danger of incision in such cases, by the fact that out of 3260 diphtheria patients admitted to hospital during the years 1927-9 inclusive, 43 had undergone previous incision of the peritonsillar tissue, and 25 of them had died—a mortality of 58 per cent, as compared with one of 3.4 per cent among cases of equal severity in which no incision had been made. High fever is a valuable symptom in distinguishing pyogenic from diphtheritic sore throat. Bilateral swelling of the fauces should suggest diphtheria, and unilateral swelling peritonsillar abscess, although there may be exceptions. In cases where a supposed peritonsillar abscess has been incised without escape of pus, diphtheria antitoxin should be given at once.

PROPHYLAXIS.—In a review of the results obtained in France by *Anatoxin*, which he introduced in 1924, G. Ramon<sup>18</sup> states that from 95 to 98 per cent, and sometimes even 100 per cent, of those inoculated according to his technique (three successive injections of 0.5, 1 c.c. and 1.5 c.c. with an interval of three weeks between the first and second injection, and one of a fortnight between the second and third) obtain sufficient immunity to convert a positive into a negative Schick reaction. Investigations have shown that the antitoxin-content of the blood of those inoculated does not diminish in the course of years and that the immunity is probably permanent. In certain countries, such as France, Canada, and Hungary, the incidence of diphtheria among those who have been given anatoxin is from one-tenth to one-twentieth of that among the non-inoculated.

E. Seligmann<sup>19</sup> records the results of active immunization against diphtheria in Berlin during 1929. Of 4501 children aged from 0 to 15 years suffering from diphtheria, 687 had been inoculated, the incidence of the disease among the inoculated being 5.5 per mille as compared with 8.2 per mille among the non-inoculated. The incidence of diphtheria among 66,874 children inoculated with toxin-antitoxin floccules was 5.4 per mille, while among 22,186 children inoculated with toxin-antitoxin it was 5.8 per mille. Seligmann estimates that probably more than 200 cases of diphtheria have been prevented by active immunization. As regards the character of the attack in the inoculated, out of 487 cases 127 were mild, 63 moderately severe, 33 severe, 13 fatal, and 251 not classified. The fatality-rate of 2.7 per cent compares favourably with the rate of 13.1 per cent among the non-inoculated.

E. Nobel,<sup>20</sup> who records his observations on 266 cases immunized by *Löwenstein's percutaneous method* (see MEDICAL ANNUAL, 1930, p. 165; 1931, p. 154), while admitting its harmlessness and simplicity, comes to the conclusion that it is far inferior to other methods of active immunization as judged by the Schick test.

Unlike Siegl (see MEDICAL ANNUAL, 1931, p. 153), R. Prigge,<sup>21</sup> as the result of experiments on guinea-pigs, maintains that the development of increased susceptibility or of the so-called 'negative phase' can be excluded in human inoculation against diphtheria.

A correspondent of the *British Medical Journal*<sup>22</sup> describes a disaster which took place in October, 1930, at Medellin in Colombia, South America, when 48 children, mostly aged between 2 and 7 years, were given an injection of diphtheria toxin in mistake for anatoxin. The dose of toxin given was 1.5 c.c., or 375 times the amount of toxin that would kill a guinea-pig. The results were as follows: (1) A group of 16 children most of whom received antitoxin recovered without sequelæ, but some were ill with symptoms of toxæmia on the first night. (2) Three children had severe pain at the site of injection with much swelling, ulceration, and necrosis, but recovered after prolonged treatment. (3) Three had severe pain and diphtheritic paralysis, but recovered. (4) Sixteen died with symptoms of high temperature, delirium, vomiting, and severe pain at the site of injection. One died within twenty-four hours, 14 within sixty hours, 1 six days after the injection, and 1 of paralysis six weeks later.

For similar disasters, which are fortunately extremely rare, see MEDICAL ANNUAL, 1927, p. 114; 1928, p. 117; 1929, p. 132.

REFERENCES.—<sup>1</sup>*Monthly Epid. Rep. Health Sect. League of Nat.* 1930, 372; <sup>2</sup>*Jour. Med. Assoc. S. Africa*, 1930, 479; <sup>3</sup>*Med. Welt*, 1930, 799, 843; <sup>4</sup>*Bull. Serr. féd. Hyg. publ.* 1930, 24; <sup>5</sup>*Rev. méd. de la Suisse Rom.* 1930, 593; <sup>6</sup>*Klin. Woch.* 1930, 1366; <sup>7</sup>*Jour. Amer. Med. Assoc.* 1931, xcvi, 1768; <sup>8</sup>*Rev. franç. de Péd.* 1930, 1; <sup>9</sup>*Amer. Jour. Dis. Child.* 1930, xl, 968; <sup>10</sup>*Zeits. f. Kinderheilk.* 1930, 1, 132; <sup>11</sup>*Dermatol. Woch.* 1930, 1303; <sup>12</sup>*Clinical Jour.* 1931, 371; <sup>13</sup>*Amer. Heart Jour.* 1930, 592; <sup>14</sup>*Lancet*, 1931, i, 240; <sup>15</sup>*Ibid.* 322; <sup>16</sup>*Thèse de Paris*, 1930, No. 323; <sup>17</sup>*Arch. of Internal Med.* 1930, xlvii, 402; <sup>18</sup>*Bull. de l'Acad. de Méd.* 1930, civ, 115; <sup>19</sup>*Deut. med. Woch.* 1931, 96; <sup>20</sup>*Wien. klin. Woch.* 1931, 75; <sup>21</sup>*Med. Klinik*, 1931, 419, 813; <sup>22</sup>*Brit. Med. Jour.* 1931, ii, 27.

**DISLOCATION OF THE HIP, CONGENITAL.** (See HIP, CONGENITAL DISLOCATION OF.)

**DISSEMINATED SCLEROSIS.** (See SCLEROSIS, DISSEMINATED.)

## DISTEMPER, CANINE.

Major Dalling, M.R.C.V.S.

A perusal of the literature indicates that canine distemper has been recognized in many countries for many years, and that from time to time a sudden increase in virulence has been experienced with disastrous results to the canine population. It was certainly present in this country in the early part of the nineteenth century (E. Jenner<sup>1</sup>), though it appears to have been confused with rabies, jaundice (yellows), etc.

The disease attacks dogs of all breeds, and recently it has been shown that distemper of the ferret (G. W. Dunkin and P. P. Laidlaw<sup>2</sup>) and of the fitch (T. Dalling<sup>3</sup>) is identical with canine distemper. It seems highly probable that the fox, both the wild and the various types in captivity, is susceptible to the disease. Distemper in cats is apparently an entirely different condition (Laidlaw and Dunkin<sup>4</sup>).

Dunkin and Laidlaw,<sup>5</sup> working under the 'Field' Distemper Fund, proved conclusively that the disease could be caused by infection with the ultra-visible virus of canine distemper found in the various tissues of affected dogs.

Previous to this announcement by these workers, much diversity of opinion existed as to the true etiology. The association of bacteria with disease generally led workers to search for a causal microbe, and from 1896, when B. Galli-Valerio<sup>6</sup> stated that he had isolated the responsible organism, many other workers have made similar claims. The most important was that put forward by J. P. McGowan<sup>7</sup> and by N. S. Ferry,<sup>8</sup> who, working independently, isolated the organism now referred to as *B. bronchisepticus* in pure culture from the respiratory tract of dogs in the early stages of the disease. T. C. Torrey and A. H. Rahe<sup>9</sup> confirmed these findings, and all claimed to have reproduced genuine dog distemper by the use of the bacillus. E. Carré<sup>10</sup> put forward an entirely opposing view, that dog distemper could be transmitted only by means of filtrates of infective material—the filtrate containing no visible known organism. He was supported by J. Lignières,<sup>11</sup> who confirmed his conclusions. Dunkin and Laidlaw,<sup>5</sup> after conducting carefully controlled experiments in which the greatest precautions against extraneous infection were observed, and in which specially bred susceptible dogs were used, were able to confirm Carré's conclusion, that the cause of genuine dog distemper is an ultra-visible virus contained in tissue of affected dogs.

Dog distemper as it occurs in the field is of variable severity and presents such a variety of symptoms that observers have described several types of the disease. The experiments of Laidlaw and Dunkin show clearly that dog distemper is a single entity. The manifold symptoms are, in many instances, due to mixed infections which are secondary to the primary virus infection. Thus bronchopneumonia which is often found among cases of distemper, especially in epidemics in foxhound kennels, is not an essential result of infection with the virus of canine distemper, but is due to infection with *B. bronchisepticus* or streptococci, or both, and it seems possible that when the virulence of such organisms is raised, they themselves, without the virus, may produce bronchopneumonia, etc. Dalling<sup>12</sup> demonstrates that, under certain conditions, dogs immune against virus distemper, when infected with *B. bronchisepticus* or streptococci, may show symptoms indistinguishable from field distemper. Because of the rapidity with which secondary infections occur among virus-infected dogs, the symptoms observed in the sick animal are often due to these infections rather than to the virus *per se*. The picture presented in the experimentally infected susceptible dog is constant and definite. Infection with virus causes an acute infectious fever characterized by an incubation period of four days, a coryza in the early stages, severe gastro-intestinal disturbances, and various symptoms due to inflammation of the respiratory tract. Severe nerve symptoms due to an encephalitis may occur. The incubation period is fairly constant. As a rule it is four days, but may vary from three to six, when there is an abrupt rise in temperature up to 105° F. or over, and a watery discharge from the eyes and nose, which varies in amount and within twenty-four hours may become purulent and persist during the whole course of the illness. The conjunctivæ are usually acutely congested. The temperature soon subsides to near the normal level, but in a day or two rises again; this second rise is slower than the first, and lasts longer. Vomiting is common in the early stages, and appetite is poor, but varies with the rise and fall in temperature. In almost every case the motions are diarrhœal, slimy, and offensive; they may contain streaks of blood. Rapid wasting occurs, the impaired appetite and diarrhœa interfering with the nutrition. Respiratory symptoms are usually slight. A slight cough is not uncommon, especially during the second temperature rise, but symptoms of definite pneumonia are not present. When the nervous system is affected, symptoms are seen late in the disease. Fits characterized by semi-consciousness, chewing movement, and the exuding

of thick saliva from the angles of the jaw occur. They pass off within a few seconds as a rule, but usually reappear in a more severe form, and ultimately attacks of epileptiform convulsions supervene; muscular spasms and twitchings may occur in such cases. The course of the illness in experimentally infected dogs varies considerably, owing partly to individual susceptibility and partly to the virulence of the strain of virus used. The case mortality is comparatively low, and though the disease may appear in an acute form, recovery is the rule, except in cases in which the nervous system is involved. This is not in keeping with experiences of those dealing with distemper in the field, where the mortality is usually high—probably because of secondary infections. Perhaps distemper in the dog can be compared with influenza or measles in man, in which a severe fever occurs but is seldom fatal unless a latent infection is lit up or secondary infections of various kinds supervene.

Some observers regard the presence of vesico-pustules as a diagnostic sign of distemper. They may occur in the course of the disease, but they are by no means constant in experimentally infected dogs (Dunkin<sup>13</sup>). They also are probably due to some secondary infective agent.

The study of distemper in the experimental animal shows that it is extremely infectious in its early stages even before symptoms are observed; the blood is highly infective during the periods, and the nasal discharge contains much virus. It seems probable that infection is by the respiratory route. Some practitioners hold that actual contact of infected and healthy dogs is not necessary for spread of infection and that the virus may be air-borne for short distances. At times, therefore, it is of urgent importance, in order to control spread of infection, to ascertain with certainty whether a dog is suffering from distemper. The recording of bi-daily temperatures of dogs exposed to infection will be found of the greatest value; any dog showing a sudden rise should be regarded as infected, and isolated for treatment; so will the spread of disease be prevented and the chances of infection by secondary agents lessened.

**The Immunization of Dogs against Distemper.**—It is well known that a dog which has survived an attack of distemper is thereafter solidly immune. Some observers describe instances of repeated attacks of 'distemper' in the same dog. It seems probable that mistakes in diagnosis are responsible for many such reports, for, as already pointed out, other infections may give rise to symptoms indistinguishable from true field virus distemper. It is possible, of course, that in a very few instances dogs have failed to become immune following an attack of the disease. Because of this solid immunity following an attack of natural distemper, those who have isolated what they considered the 'cause' of the disease have been encouraged to attempt immunization by means of vaccines made from the 'causal' micro-organism. Good results have been claimed by practically all, but close examination under experimental conditions has failed to verify the good results. It is to be expected that in any given canine population almost any vaccine will apparently yield some protection, because some of the treated animals will already be naturally immune. No vaccine made from any culture of organisms isolated from dogs suffering from distemper has stood the test of time. Apparently **Bronchisepticus Vaccine** has given protection in a few rare outbreaks of 'distemper' caused by that bacillus.

Some early immunization attempts made were based on the assumption that distemper was caused by an ultra-visible virus and not by any visible micro-organism. Thus V. Puntoni<sup>14</sup> raised the virulence of the virus by transferring it from dog to dog by intracerebral injection. He inactivated the virus contained in brain by formalin, and found that the product so produced was an efficient **Vaccine**. Also C. Lebailly<sup>15</sup> prepared vaccines, for which he claimed

success, from the spleen of infected dogs. Laidlaw and Dunkin<sup>16</sup> showed very clearly that it is possible to immunize dogs successfully against distemper, and their methods have been elaborated so that the issue of reliable products on a large scale has now been rendered possible. The methods centre round the obtaining of quantities of potent distemper virus. The failure up to the present to cultivate the virus on any artificial medium has necessitated the use of animal tissue containing an abundance of potent virus. There are two susceptible laboratory animals, the ferret and the dog, both of which are used in the preparation of materials for the immunization of dogs against canine distemper. Two methods are now used on a large scale in this country—namely, the use of vaccine followed by living virus, and the simultaneous injection of hyper-immune serum and living virus.

*The Vaccine-Virus Method.*—Laidlaw and Dunkin<sup>17</sup> worked out the **Vaccine-Virus** method of immunization in ferrets. The vaccine was made by treating with formalin the spleens of sick ferrets which had been infected with virus distemper. Experiments showed that the administration of a dose of such a vaccine to ferrets induced a considerable degree of resistance to artificial or natural virus infection, and that if this dose of vaccine was followed by a small dose of living virus, the induced resistance was consolidated and rendered lasting. They used ferret vaccine followed by living virus as immunizing agents in dogs, but found that multiple doses of vaccine were necessary to produce sufficient resistance in the dog to protect against a dose of living virus. They then transferred their attention to dog tissue rich in active virus, which they converted into vaccine, and found that one dose of such vaccine induced sufficient resistance in a susceptible dog to protect against a small dose of living virus injected seven days later, and that a dog which had received such treatment was solidly immune. Their laboratory and field trials were so remarkable that the demand of the dog-owning public for material necessitated the making of these products on a very large scale. This was undertaken in England, and material for the vaccine-virus method of immunization has been prepared since 1929. In connection with the preparation and use of these materials there are several highly important points:—

1. The efficacy of vaccine depends to a large extent on the original virus-content of the tissue used. Distemper virus is contained in many tissues: the blood, especially during the febrile periods; the spleen, especially late in the course of the illness following infection with virus; the lymphatic glands, particularly the mesenteric; the liver; and the central nervous system following evidence of nervous complications. Blood has been unsatisfactory as a source of vaccine, but the other tissues mentioned, provided they are harvested when rich in virus-content, can all be transformed into efficient vaccine. For the obtaining of tissue suitable for vaccine production, dogs are infected with distemper virus (usually infected ferret spleen), and are killed late in the course of the infection, when spleen and mesenteric lymphatic glands are usually rich in virus-content. Liver is less reliable as a virus-containing tissue, even when harvested late in the course of the infection. Virus-content can be accurately determined only by injecting measured quantities of the tissue into susceptible animals (ferrets are used mostly). A full account of the method of transforming virus-containing tissue into vaccine by the use of formalin is given by Laidlaw and Dunkin.<sup>17</sup> Some difficulty has been experienced in determining the best stage of infection at which to harvest tissues to obtain the richest yield of active virus—for example, there is considerable danger in waiting till late in the course of the infection because of the susceptibility of dogs generally to invasion of body tissue by micro-organisms present in the intestine. Experience alone can teach when best to harvest.

2. The virus used in the second injection must be active, and sufficiently potent to create the desired degree of immunity. In their original experiments in the laboratory and in the field, Laidlaw and Dunkin used saline emulsions of infected ferret spleen, and during the early commercial issue a similar emulsion was used. It soon became evident that in large-scale work such a method was unreliable, for the virus did not invariably remain potent under such conditions (Dalling<sup>18</sup>). It was shown that such virus-containing tissue could be dried *in vacuo*, and under suitable conditions of drying the resulting dry powder retained most of the virus contained in the original moist tissue. This dry virus will withstand transport conditions for long periods (Dalling<sup>18</sup>). Thus the difficulty of preparing active virus for large-scale distribution has been overcome.

3. The original recommendation of Laidlaw and Dunkin was that living virus should be administered seven days after vaccine. Recent tests indicate that two weeks after the injection of a dose of vaccine a higher degree of immunity is present than after one week: thus it is recommended that about fourteen days should elapse between the injections of vaccine and virus, and it has been found that such treatment reduces to a minimum the risk of any severe reaction following the injection of virus after vaccine.

The results of the use of the vaccine-virus method have, on the whole, been excellent, provided the vaccine was made from tissue rich in virus, the injected virus was active, and that the reservations concerning the health and isolation of the treated animals were observed. Many severe tests were made by the originators of the method, and in all the efficacy of the method has been amply proved as a means of inducing active immunity of a high lasting order. This was confirmed by Dalling and Mason. For some little time during the large-scale issue the results were not entirely satisfactory, owing in a large measure to the failure of virus in the moist state to withstand transport by the usual channels, particularly in hot weather. Since dry virus was substituted for moist, the former satisfactory result was obtained. Observations on several thousands of dogs of all breeds indicate that the method is entirely satisfactory when carried out according to instructions. It is now in routine use by many members of the veterinary profession.

*The Serum-Virus Simultaneous Method.*—The production of a dog distemper anti-serum engaged the attention of Laidlaw and Dunkin for some time, and in 1931 they published records of the successful preparation of such a serum.<sup>19</sup> Others had attempted this work and had prepared sera, but Laidlaw and Dunkin could not show that the samples examined by them were of high potency. Dogs which have been immunized against distemper or which have recovered from the natural disease, are kept for at least a month and are then treated with a large dose of potent virus on two successive days. Within a week their serum is harvested and tested for potency. Some indication of potency is afforded by the application of the complement-fixation test, in which virus, anti-serum, and complement are mixed together in various proportions. There is as yet no proof that the complement-fixing antibody and the protective antibody go hand in hand, but the results of the test are of some value in determining the day on which to harvest the serum. Anti-serum is now produced on a large scale in England. In the production of active immunity in several 'virus diseases'—e.g., rinderpest and hog cholera—the simultaneous injection of **Anti-serum and Virus** is the standard method. Experiments in the laboratory and the field indicate that, applied to dog distemper, the method is of considerable value. A dose of serum sufficient to prevent any undue reaction from a dose of active virus is used, and the serum and virus are injected simultaneously into different parts of the body.

It appears that the amount of serum injected has little influence on the resultant degree of immunity produced: it must, of course, be at least sufficient to prevent a reaction due to virus. Excess of serum is not thought to prevent the development of active immunity. The great advantages of the method are that the two injections are given at the same time; there is no need to allow fourteen days to elapse as in the vaccine-virus method, and should a severe reaction be observed a few days following the treatment, an extra dose of anti-serum will usually cut short the illness. The results of this method of treatment to date indicate that it is less satisfactory than the vaccine-virus method for two reasons:—

1. In some instances severe reaction has occurred within a week of its administration. The practice among foxhounds, etc., is to inject them 'at walk'—i.e., on the farms, etc.—all over the district, and thus the injector has little or no opportunity to observe them after treatment and must rely on information received from the 'walker', who cannot be expected to recognize a reaction in its early stages. Occasionally a hound treated by this method has reacted so badly that it has been lost.

2. The immunity induced may not be of a lasting character. While there are only a very few 'break-downs' on record, the number much exceeds that following vaccine-virus treatment, and more research should be done and more observations made before the serum-virus method is substituted for the vaccine-virus method.

**Anti-serum used in Distemper Cases.**—Many experiments have been carried out to determine the value of distemper anti-serum in effecting a cure in dogs ill with distemper. In the testing of the potency of any batch of distemper serum two main methods have been adopted:—

1. The simultaneous injection of a fixed infective dose of virus with varying doses of serum in a series of susceptible dogs. A highly potent serum will in a dose as low as 3 c.c. prevent any reaction, even a rise in temperature.

2. The injection of a series of susceptible dogs with a fixed infective dose of virus and their subsequent treatment with anti-serum on different days. A highly potent serum will effect a 'cure' when administered up to four days after infection with virus, even if the primary temperature rise be present. From this it will be gathered that the use of distemper anti-serum in adequate doses is valuable in the treatment of dogs suffering from distemper, provided the treatment is adopted in the earlier stages of the illness. Recently Laidlaw and Dunkin<sup>19</sup> have succeeded in concentrating the protective antibody in distemper anti-serum, and the results of its use in distemper cases are highly satisfactory. Serum must, however, always be given prior to the development of disease due to secondary infections.

The use of anti-serum prophylactically is also valuable in dogs which have been exposed to recent infection and which have not yet shown clinical evidence of infection.

**The Use of Two Doses of Vaccine.**—For a short time when it was found impracticable to issue active distemper virus, recourse was made to the use of two doses of vaccine as an immunizing method (Dalling).<sup>16</sup> Experiments in the laboratory indicated that immunity of a fairly high order could be induced by this method. The effects in the field were very variable, and while some excellent results were recorded, the method because of its unreliability is not at present recommended. There would appear to be a direct relationship between the efficacy of the method and the antigenic value of the vaccine used. While all batches of vaccine must conform to a minimum standard by actual tests on dogs, a suitable method for ascertaining their true value has not yet been worked out. It seems possible that their maximum value will vary considerably.



**Distemper of the Ferret and Fitch.**—The ferret and fitch are susceptible to canine distemper and the disease spreads rapidly under natural conditions, causing a high mortality. The incubation period is about ten to twelve days, although it may be prolonged till the sixteenth day. The first symptom is a watery appearance of one or both eyes with a reddening of the eye itself, and perhaps a watery discharge from the nose. The eyelids soon begin to swell, and by the next day the discharge from the eyes is thick and yellowish. A slight swelling of the chin occurs, with small vesicles containing fluid. Soon the vesicles give place to brownish, dry crusts. The animal becomes weak, the coat stares, all food is refused, and by the fourth, fifth, or sixth day symptoms of collapse appear and death takes place. Occasionally symptoms of a nervous type are seen, varying from slight twitchings of the head to violent generalized convulsions. Distemper in the ferret or fitch may be complicated with infections of the lungs and intestines due to secondary agents. Recoveries are rare; recovered animals are found to be solidly immune. They may, however, harbour the virus, and while themselves remaining healthy, may infect other susceptible animals and so give rise to a new outbreak.

Treatment of severely affected fitches is of little avail, but preventive vaccination can be carried out successfully. Laidlaw and Dunkin<sup>17</sup> showed that it was possible to immunize ferrets against distemper by injecting a dose of vaccine made from tissue of infected ferrets, followed by a small dose of living virus; recently Dalling<sup>3</sup> has shown that the same method may be applied with success to the fitch. The use of distemper anti-serum made in dogs is of little value in ferrets or fitches when administered after the appearance of symptoms; when used within a day or two following exposure to infection, it gives complete protection.

REFERENCES.—<sup>1</sup>*Med.-Chir. Trans.* 1809, i, 165; <sup>2</sup>*Jour. Comp. Pathol. and Therap.* 1926, xxxix, 201; <sup>3</sup>*Vet. Record*, 1931, xlii, 1051; <sup>4</sup>*The Field*, 1928, Nov. 29; <sup>5</sup>*Jour. Comp. Pathol. and Therap.* 1926, xxxix, 399; <sup>6</sup>*Centralb. f. Bakteriolog.* 1908, xli, 546; <sup>7</sup>*Jour. Pathol. and Bacteriol.* 1911, xv, 372; <sup>8</sup>*Jour. of Infect. Dis.* 1911, viii, 399; <sup>9</sup>*Jour. Med. Research*, 1931, xxvii, 291; <sup>10</sup>*Comptes rend. Acad. des Sci.* 1905, xli, 689; <sup>11</sup>*Bull. Soc. cent. de Méd. vet.* 1906, lxxxiii, 622; <sup>12</sup>*Vet. Record*, 1929, xlviii, 1049; <sup>13</sup>*Ibid.* 1926, vi, 193; <sup>14</sup>*Ann. d'Igi.* 1924, xxxiv, 406; <sup>15</sup>*Comptes rend. Acad. des Sci.* 1927, clxxxv, 370; <sup>16</sup>*Jour. Comp. Pathol. and Therap.* 1928, xli, 209; <sup>17</sup>*Ibid.* 1; <sup>18</sup>*Vet. Record*, 1931, xxxiii, 617; <sup>19</sup>*Jour. Comp. Pathol. and Therap.* 1931, xlii, 1.

## DRUG ADDICTION. (See ALCOHOL AND DRUG ADDICTION.)

## DUODENUM, SURGERY OF. (See also GASTRODUODENAL ULCER.)

A. Rendle Short, M.D., F.R.C.S.

**Duodenal Ileus.**—This is a common ailment in adults past thirty, producing rather vague dyspeptic symptoms, and often vomiting, without severe pain. The discomfort is usually one or two hours after food. It is recognized by the dilatation of the second and third parts of the duodenum, and stasis of the contents, seen with X rays after a barium meal. It is due to the pressure of the superior mesenteric vessels where they cross the third part of the duodenum. The usual treatment, if operation is necessary, is a duodeno-jejunostomy. But as Gayner Jones<sup>1</sup> points out, the vessels only press on the duodenum when they are pulled taut, and the usual cause of the tension is prolapse of the cæcum, or masses of terminal ileum, into the pelvis. So much ileum may be forced down that it cannot get up again, and is caught as in a bottle-neck. All that may be necessary, when the mesenteric vessels are obviously strained tight, is to lift the ileum out of the pelvis and to push down pelvic colon instead. Or if the cæcum is prolapsed, it may be fixed. [We quite agree, but prefer caecoplication to Waugh's operation as a means

of reducing the size and length of cæcum, in the few cases where surgical treatment is indicated.—A. R. S.]

**Duodenal Fistulæ.**—According to J. Murard,<sup>2</sup> these may follow an operation for perforated duodenal ulcer, operative wounds, or periduodenal ulceration, and are often due to the use of a rubber drainage tube. They generally close spontaneously in a few weeks. If they do not, they may be attacked *directly*, by over-suturing the hole in the duodenum, or excising it, or, indirectly, by means of a gastrojejunostomy with pyloric exclusion. It may be necessary to drain the gall-bladder. If the anterior duodenal wall is fistulous, the direct method is better; if the posterior, the indirect.

J. V. Bohrer and A. Milici<sup>3</sup> write on the same subject. The diagnosis can readily be made by giving 5 gr. of methylene blue in capsule by mouth. In their experience, spontaneous closure is *not* likely; in cases due to any other cause than perforated ulcer the condition rapidly gets worse by self-digestion, and the patient goes downhill fast. [This is my experience.—A. R. S.] The treatment advised is to introduce into the wound a fenestrated tube (fenestrated, to avoid blocking) and to apply continuous suction. In addition, a beef extract named **Bovinine** may be inserted for the peptic and pancreatic juices to act on. If operation is necessary, direct closure is likely to be difficult. Jejunostomy is quick, simple, and allows immediate feeding. Gastro-enterostomy with pyloric exclusion is second best.

**Cancer of Duodenum.**—J. W. Hinton<sup>4</sup> points out that duodenal ulcer almost never goes on to cancer. Duodenal cancer does occur; J. Meyer and D. H. Rosenberg<sup>5</sup> describe four cases in their practice. The symptoms are like those of cancer of the stomach or pylorus, with jaundice. According to J. E. Schofield,<sup>6</sup> of Swindon, the location of the growth in reported cases has been: above the ampulla 30, ampullary 104, below the ampulla 19. In a few cases the growth has been successfully removed, but as a rule all that can be done is cholecystgastrostomy, with or without gastrojejunostomy. A case is figured (*Plate XIII*).

G. P. Muller and L. Rademaker<sup>7</sup> collect from the literature 19 recent cases treated by radical removal, with 8 survivals. Older figures (59 cases) gave a death-rate of 45 per cent. Nine patients are known to have lived three or more years. Transduodenal excision with re-implantation of the common duct was the usual method. [I have only once felt sure at operation that I was dealing with a case of duodenal cancer. Gastrojejunostomy was performed. The patient was alive and well many years after.—A. R. S.]

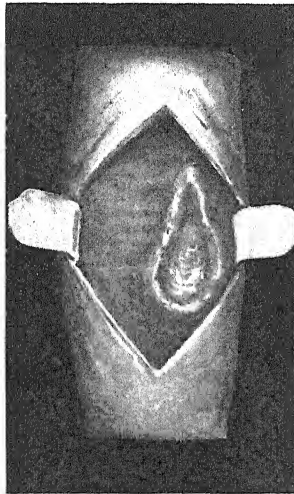
**Periduodenitis.**—Jan Schoemaker, of The Hague, contributes an article, in English<sup>8</sup> and German,<sup>9</sup> on the subject of this common and important condition, which is but little recognized by text-books, but forces itself on the notice of operating surgeons. The adhesions lie between the duodenum, the gall-bladder or liver, and transverse colon, and are of two types: (1) Cord-like bands due to cholecystitis, duodenal ulcer, or following operation. These are unimportant and do not often produce symptoms. (2) Thin delicate spider-web-like veils, with none of the above causative factors. These give rise to symptoms like those of gastroduodenal ulcer, but there is always something atypical about the picture. Nocturnal pain, and typical hunger pain are infrequent; warm milk does not give complete relief, nor does dieting, but rest ameliorates the symptoms. Most of the patients are young men. The physical examination reveals nothing. The barium meal shows some deformation of the duodenal cap [but often delay instead of haste in emptying the stomach—A. R. S.].

Schoemaker believes there are two causative factors. The first is that it is associated with Jackson's pericolic membrane, and he regards both as

*PLATE XIII*

CANCER OF THE DUODENUM

(J. E. SCHOFIELD)



Duodenum opened, edges retracted, exposing malignant ulcer on postero-medial wall, encroaching proximally on ampulla.

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'British Journal of Surgery'*



'foetal growth structures'. In 3 out of 7 fetuses examined, a similar membrane was present. The other factor is the so-called 'red stomach'. The redness is always confined to the pyloric part of the stomach, but occasionally spreads on to a veil present on the duodenum. The redness, as shown by histology, is not inflammatory, but due to fullness of the capillaries and small vessels of the serosa. The deeper layers are normal.

Surgery is not indicated. There is a large nervous factor in the symptoms, and the patient after operation is soon complaining again. Treatment consists in **Rest, Suggestive Therapy, Anti-nervine**, and **Diathermy** to the epigastrium. As a rule, however, the diagnosis is not made until operation. If the adhesions are irregular and cord-like, and mostly connect the duodenum and gall-bladder, the trouble probably arose in the gall-bladder, though they may be congenital. If there is a veil-like periduodenitis, passing over to the transverse colon, it is useless and pernicious to perform gastrojejunostomy. If any particular band appears to be acting as a constrictor, it should be divided. Otherwise, it is better to do nothing, or a duodenal exclusion may be performed. Schoemaker tried this on 3 cases; 2 were cured, the third was no better. The main virtue of the exploratory operation is that it enables us to assure the patient that there is nothing serious the matter.

[A very useful paper on an obscure subject. In my experience what one usually finds is that the duodenum and gall-bladder are closely adherent to one another, being held together by fine fibrous tissue with normal-looking peritoneum surrounding the whole. In such cases I usually remove the gall-bladder, cover the area with peritoneal flaps as far as possible, and sew an omental graft over the raw duodenum. The patients are generally relieved, but not always permanently.—A. R. S.]

REFERENCES.—<sup>1</sup>*Guy's Hosp. Rep.* 1930, Oct., 475; <sup>2</sup>*Bull. et Mém. Soc. de Chir.* 1930, Dec., 1458; <sup>3</sup>*Ann. of Surg.* 1931, June, 1174; <sup>4</sup>*Amer. Jour. Med. Sci.* 1931, June, 843; <sup>5</sup>*Arch. of Internal Med.* 1931, June, 917; <sup>6</sup>*Brit. Jour. Surg.* 1930, July, 84; <sup>7</sup>*Ann. of Surg.* 1931, March, 755; <sup>8</sup>*Surg. Gynecol. and Obst.* 1930 Dec., 840; <sup>9</sup>*Arch. f. klin. Chir.* 1930, Nov., 609.

## DYSENTERY, AMOEBIC. (See AMOEBIASIS.)

### DYSENTERY, BACILLARY. *Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

**Serum Treatment.**—P. T. Lantin<sup>1</sup> has recorded a valuable analysis of 2259 cases of bacillary dysentery treated in the Philippine General Hospital during the course of seventeen years, of which 885 received intramuscular injections of serum and 33 were given the serum by the rectum. It is essential that the serum should be a potent one. Children of 1 to 5 years of age formed 51 per cent of the patients, and the fatality-rate is highest in them owing to their lack of resistance to the toxins. The duration of the illness before treatment is of vital importance, as it is only by early treatment that the toxins can be neutralized before they are so firmly fixed in the tissues that the damage cannot be undone. Full doses as early as possible are essential to success, such as 20 c.c. three times a day intramuscularly up to a total of 50 to 150 c.c., and the same doses should be given to children as to adults. An injection of 1 c.c. an hour before the full dose will prevent anaphylaxis. Good results have also been obtained by rectal administration, and experience has shown that the rapid injection of the serum into the rectum through a soft catheter attached to a syringe is better than the slow gravitation method, especially in children, to whom it may even be given without waking them. It exerts in this way antibactericidal as well as antitoxic effects. A preliminary cleansing enema is required, and in adults 5 to 10 c.c. of **Elixir Paregoric** orally is

of help. The results were very encouraging, with improvement in one day. This plan can be combined with intramuscular injections. The serum may also be given intravenously in grave cases with great advantage.

REFERENCE.—<sup>1</sup>*Amer. Jour. Med. Sci.* 1930, Nov., 635.

### DYSMENORRHOEA. (See also ENDOMETRIOSIS.)

*Beckwith Whitehouse, M.S., F.R.C.S.*

No one will deny that pain associated with the menstrual function, in spite of recent advances in our knowledge of female sex physiology, remains in many respects a perplexing problem. Although the histology of the endometrium and the processes underlying ovulation and the function of the ovarian, thyroid, and pituitary hormones, have been investigated in detail during the last few years, the application of this knowledge to the relief of dysmenorrhœa has not been associated with any real improvement in therapeutic results. One reason, no doubt, lies in the fact that pain as such is and always will be intimately bound up with individual idiosyncrasy. Of all symptoms it is the most unreliable. The pain sense varies so enormously in individuals, just as it does in animals.

Apart altogether, however, from the question of individual variation, another factor is of importance in moulding our conception of pain in relation to the menstrual function—namely, education of the pain sense. Women have been led by tradition to expect a certain amount of pain at the menstrual epoch. By some it is indeed regarded as a heritage of their sex, as witness the term 'poorly time' applied to the monthly function. Psychological influence and mental suggestion have without doubt an important influence, especially with some individuals. If pain is expected by a patient, its incidence is commonly an accepted fact. By repeated assaults the brain may be educated to an abnormal appreciation of subacute stimuli. In the same way, once a profound impression has been received by the cerebral cortex, this impression tends to persist even when the cause is removed—e.g., the pain referred to the stump of a limb after the limb has been amputated. Facts such as these demonstrate the importance of developing a healthy and rational state of mind in connection with the phenomena of the sexual function. With the normal hyperæsthetic state that pertains to the menstrual epoch it is easy for subjective sensations to become pathological and for such sensory impressions to be interpreted in terms of 'pain'. For a patient to assert when asked whether menstruation is painful, that she experiences "no more pain than the ordinary", implies a pathological attitude of mind with regard to the function which under altered circumstances may easily gravitate into a state of incapacity.

That a healthy state of mind will go far towards removing any painful disability of menstruation is well exemplified in the case of hospital nurses. It is the experience of several matrons and 'Home' sisters that when girls first commence their hospital training they are anxious to continue ways they had acquired at home—to have time off, to have a rest from their duties, and so on—at the menstrual period. When told that they must learn to 'carry on' or give up their work, it is the exception for a girl to be incapacitated for this reason. During the twenty-three years that the writer has been associated with a large hospital he can recall only three instances of a nurse being 'warded' for dysmenorrhœa.

The patient with the psychological type of menstrual pain is known only too well in many a consulting-room. The treatment of this group is discussed by B. Venn Dunn,<sup>1</sup> who has recently summarized in an excellent paper current views on dysmenorrhœa. Quite rightly he emphasizes the importance of catching such a patient young, and before the 'habit of pain' is too well formed.

The Medical Women's Federation have recently issued a leaflet under the title "Advice regarding Menstruation", which may be recommended to these patients and should prove useful to many. It advises 'business as usual' during the menstrual period. The necessity for a daily warm bath *during* the function is advocated. Whilst insisting upon the advantage of an adequate amount of exercise at all times, it deprecates "long expeditions and cycle rides or matches or competitions in which there is a strong incentive to exhaust the reserves of strength".

The importance of physical exercises for girls, and especially for the adolescent, is now generally recognized. N. F. Miller,<sup>2</sup> in a recent communication to the American Medical Association based upon a study of 785 university undergraduates, observes that while it cannot be said that faulty posture or poor muscle tone causes dysmenorrhœa, a decrease in the occurrence of menstrual pain is certainly coincident with improvement in posture and muscle tone.

To arrive at any true estimate of the frequency of dysmenorrhœa in the community is a matter of some difficulty. This is only too evident when comparison is made between the figures of different observers. Some years ago C. Chisholm<sup>3</sup> gave an incidence of 77 per cent amongst teachers and workers, whilst M. P. Jacobi<sup>4</sup> quotes 46 per cent for the same section of the population. M. A. Hodge,<sup>5</sup> on the other hand, found that amongst 974 healthy women of an athletic league, the frequency of menstrual pain was 31 per cent. It is evident that each of these observers must have a different standard upon which the statistics are based. It is also equally obvious that these relatively high figures are only obtained by including cases of very slight disability. A more correct estimate of the frequency of dysmenorrhœa is contained in C. Chisholm's analysis of 500 school-girls. In this series 42 per cent complained of pain. Of this number the pain was severe in only 7.8 per cent, and total incapacity existed in 1.8 per cent. Of 2000 women, single and married, examined by Chisholm during the War preparatory to manual labour, only one was rejected for dysmenorrhœa. It is evident, therefore, that some reconsideration is necessary of the type of case to which the term 'dysmenorrhœa' may correctly be applied. To label a patient as such who complains of nothing more than an exaggeration of the symptoms usually termed 'menstrual molimina' is essentially wrong. Backache, cephalalgia, pain in the lower limbs, and so forth, vary with the hyperæsthetic index of the individual, but are not to be confused with true menstrual pain, which is essentially uterine. Neither should 'dysmenorrhœa' include cases of menstrual pain associated with gross disease of the pelvic organs, e.g., pelvic inflammation, some displacements of the uterus, and certain cases of uterine fibroids. The word when used in this connection is a misnomer, and we consider the term 'menorrhagia' preferable to express that painful menstruation which is a mere incidental clinical concomitant of a variety of lesions. True dysmenorrhœa we are inclined to regard as being essentially uterine colic. Such a spastic lesion is not a symptom but a clinical entity, to be separated quite clearly from the conglomeration of clinical material associated with menstrual discomfort for which the term 'menorrhagia' is more suitable.

Venn Dunn<sup>1</sup> also quarrels with the old classification and nomenclature, pointing out that the terms 'spasmodic' and 'congestive' are not relative and cannot easily be differentiated. 'Spasmodic' denotes a disorder of function, whilst 'congestive' implies a morbid anatomy. The importance of a complete investigation of every case of really severe menstrual pain cannot be over-emphasized, and Dunn suggests the following classification as being of practical value: (1) Psychological; (2) Endocrine; (3) Mechanical; (4) Gross pathological.

Regarding the endocrine group, we [B. W.] have stated elsewhere<sup>6</sup> that we believe *true* dysmenorrhœa to be primarily due in the majority of instances to disturbances in endocrine balance. We have pointed out that in a very large percentage of cases there is evidence of *over-stimulation of the stroma cells of the endometrium*, due presumably to *excessive lutein activity* of the ovary. This probably implies overaction of the pituitary  $\beta$  hormone or 'Prolan B' (Zondek). The exacerbations of pain so characteristic of this type of uterine colic are due to the separation and passage of large flakes of the stroma type of menstrual decidua. Membranous dysmenorrhœa is really an extreme form of the same process which causes severe pain in the more common type of case.

On the other hand, overaction of the  $\alpha$  hormone and overproduction of oestrin may be responsible in some cases for the occurrence of dysmenorrhœa in girls who mature early and exhibit well-marked secondary sex characters and menstruate profusely. Pre-menstrual treatment with **Magnesium Sulphate** frequently affords considerable relief to this type of patient.

A third group occurs which is apparently the converse of the preceding and where there appears to be a deficiency in the  $\alpha$  hormone and a shortage of oestrin. In this type the menstrual flow is short in duration and small in amount. Such an individual usually shows evidence in other directions of a lack of sex hormone. The breasts are rather undeveloped, the hips are narrow, and the skin is dry. In our experience the endometrium in these cases generally exhibits under-development and inactivity of the corporeal glands; and since we believe that the secretion of the uterine glands is an important factor in dissolving the products of the menstrual abortion, insufficiency in this direction may certainly be a factor in the production of menstrual pain.

Until comparatively recently mechanical considerations occupied a high place in the theories suggested to explain the cause of severe dysmenorrhœa. Uterine polarity, congenital uterine defects such as the 'conical cervix', the 'adolescent' long cervix, the 'cochleate uterus', and so forth, have all been put forward as the important factor in the production of menstrual pain. Whilst admitting that one or more of these conditions not uncommonly co-exists and certainly acts deleteriously by exaggerating any degree of uterine colic, we are not prepared to go further, for the simple reason that all these congenital defects exist on occasion in women who seek advice for sterility, but who never complain of pain during the menstrual function. If dysmenorrhœa exists in such a patient, the pain may be *relieved* by means directed to remedy a congenital anomaly of the type mentioned, but it is *unwise ever to promise a cure*. It is the experience of many that after a few months the pain only too commonly returns and is as bad as ever. Should evidence of genital hypoplasia be present, any surgical procedure should therefore always be supplemented by the administration of **Oestrin**, **Anterior Pituitary**, and **Thyroid**.

The administration of **Atropine** in doses of  $\frac{1}{200}$  to  $\frac{1}{100}$  gr. three times a day for two days before the expected period may suffice to relieve the pain of uterine colic as a temporary measure whilst treatment on the general lines indicated is being established. Dunn<sup>7</sup> suggests that in severe cases atropine may advantageously be combined with **Luminal**  $\frac{1}{2}$  gr., **Pyramidon** 5 gr., and **Extractum Hyoscyami** 1 gr., prescribed in a cachet.

**Hysterectomy** is still performed for very severe incapacitating dysmenorrhœa when all other measures fail, but it must always be regarded as a confession of failure of more rational treatment. To avoid such a drastic procedure we have on occasion made an intra-uterine application of **Radium** with the intention of suspending for a time, but not abolishing, the menstrual function. The results in some, but by no means all, patients have been satisfactory when



menstruation is resumed in from twelve to eighteen months from the date of application.

Binet,<sup>7</sup> in a similar attempt to avoid radical measures, has recently **Resected the Pre-sacral Nerve and Excised the Sympathetic Fibres** between the common iliac arteries. In a report on 32 cases he claims that relief from pain is generally secured, and describes the operation as "easy, and, above all, efficacious".

D. Bloss,<sup>8</sup> on the other hand, treats dysmenorrhœa by the **Injection of Alcohol** (5 c.c. of 70 per cent alcohol with 5 per cent novocain) on each side of the cervix. He believes that dysmenorrhœa is associated with increased sensitivity of the uterine sympathetic ganglia, and observes that the alcohol treatment in his hands has given excellent results over a period of ten years, and that no harmful results have accrued.

So far no mention has been made of dysmenorrhœa in relation to gross pathological lesions, apart from observing that we prefer the term 'menorrhagia' for pain of this character. The severe pain so often associated with such organic lesions as chronic salpingo-oöphoritis, endometrioma, pelvic appendicitis, certain uterine fibroids, and so forth, is not true dysmenorrhœa such as we have been discussing. It is a thing apart. Nevertheless the possibility of the existence of an organic lesion causing menorrhagia should never be lightly dismissed. The only way to avoid mistakes is not to treat severe dysmenorrhœa symptomatically, but to insist upon a careful rectal or vaginal bimanual examination of the pelvic organs—if necessary, under anæsthesia.

REFERENCES.—<sup>1</sup>*Brit. Med. Jour.* 1931, 971; <sup>2</sup>*Jour. Amer. Med. Assoc.* 1930, ii, 1796; <sup>3</sup>*Jour. Obst. and Gynæcol. Brit. Emp.* 1913, xxiii, 288 and 389; <sup>4</sup>*The Question of Rest for Women during Menstruation*, New York, 1877; <sup>5</sup>Blair Bell, "Intrinsic Dysmenorrhœa", *Jour. Obst. and Gynæcol. Brit. Emp.* 1923, xxx, 128; <sup>6</sup>*Ibid.* xxxiii, Nos. 3 and 4; <sup>7</sup>*Bull. Soc. d'Obst. et de Gyn.* 1930, Oct., 590; <sup>8</sup>*Münch. med. Woch.* 1929, lxxvi, 1173.

## DYSPEPSIA, INTESTINAL.

Robert Hutchison, M.D., F.R.C.P.

There are two conditions to which the term 'intestinal dyspepsia' may be applied: (1) Excessive putrefaction of proteins; (2) Abnormal fermentation of carbohydrates. Hitherto attention has chiefly been directed to the former. It is assumed that putrefaction may occur either from excessive ingestion of proteins, e.g., in meat, or from the presence of abnormal micro-organisms; that amines are produced and that the absorption of these produce the symptoms commonly spoken of as 'alimentary toxæmia'. W. E. Fitch<sup>1</sup> distinguishes three types of such toxæmia: (1) The indolic, associated with an excess of indican in the urine; (2) The saccharobutyric, which is caused chiefly by the *B. aerogenes capsulatus* and marked by the passage of fermenting stools and excessive quantities of offensive flatus; and (3) A combined indolic and saccharobutyric type. V. Leonard and W. A. Feirer,<sup>2</sup> on the other hand, consider that there are but two species of organisms responsible for true putrefaction in the human intestine—the *Clostridium sporogenes* and *Clostridium putrificum*—and from careful observations on a large number of persons they conclude that intestinal putrefaction in man is not nearly so common as is supposed. They have an open mind as to the importance of intestinal putrefaction as a cause of disease, but find that the administration of **Di-hydranol** in doses of 0.3 to 0.45 gm. three times daily destroys the true putrefactive flora of the intestine with great certainty and regularity and without any risk. It should therefore be possible, by destroying these organisms, to show whether intestinal putrefaction is the cause of clinical symptoms or not. In connection with this whole subject the reader would do well to refer to the article on the intestinal flora published in this ANNUAL for 1930, p. 291.

As regards intestinal carbohydrate dyspepsia, A. F. Hurst and F. A. Knott<sup>3</sup> point out that the starch of the food is normally digested chiefly by an active diastasic ferment contained in the intestinal juice. If the secretion of this juice is deficient, as it may be in cases of intestinal catarrh, a quantity of undigested starch reaches the colon and undergoes fermentation, with the production of acids and gas. This can never happen in cases of achlorhydria, for then the ptyalin of the saliva can compensate for the absence of the intestinal diastase, there being no free acid in the stomach to destroy it. These writers regard potato starch as specially apt to cause trouble, whilst R. Goiffon<sup>4</sup> blames the starch of rice, tapioca, and (especially) bananas.

The chief symptom of intestinal carbohydrate dyspepsia is discomfort and fullness in the lower abdomen. This is often worst during the night, and is a common cause of insomnia. Large quantities of odourless flatus are passed and there may be attacks of diarrhoea with sour, fermenting stools; usually, however, the bowels are regular. The motions contain unaltered starch granules and an excess of enterococci, but these are the result of the excess of carbohydrate in the colon and not the cause of the fermentation.

The treatment of carbohydrate intestinal dyspepsia is simple. Sugars are perfectly digested, and in all but the most severe cases in which chronic diarrhoea is present, free starch, as in flour and bread, is well digested, as the pancreatic amyllopsin can very easily deal with this. As there is very little starch in green vegetables it is also unnecessary to prohibit them, unless irritation of the intestines by the products of fermentation has been sufficiently great to make it necessary for a time to avoid anything which irritates the mucous membrane mechanically. In severe cases, therefore, it is best to exclude vegetables of every kind and also rice. In milder cases, and in more severe ones as soon as the diarrhoea has ceased, green vegetables can be allowed as purées, and at a still later stage there need be no limitation in anything but root vegetables, cauliflower, and rice. In most cases after a comparatively short time it is possible to make the restrictions gradually less severe until finally nothing but potatoes is prohibited. Occasionally after a time the power of digesting starch returns completely, but more commonly potatoes have to be avoided or greatly restricted for the rest of the patient's life, and in severer cases the permanent restriction extends to all root vegetables and rice.

Progressive changes in the diet can be most satisfactorily controlled by examining the stools, which should at no time contain any excess of starch or produce any gas on incubation. The excess of enterococci should also disappear within a few days of commencement of treatment and should at no time reappear. In milder cases, however, the patient's symptoms are a sufficient guide to treatment, as so long as he feels comfortable and passes no excess of gas, the restrictions in diet can be presumed to be sufficient.

An active preparation of **Diastase** may be given with advantage at each meal, and, if there is any diarrhoea a teaspoonful of **Chalk** may be taken three times daily.

REFERENCES.—<sup>1</sup>*Med. Jour. and Record*, 1930, Aug. 20, 183; <sup>2</sup>*Johns Hopkins Hosp. Bull.* 1931, Jan., 25; <sup>3</sup>*Quart. Jour. Med.* 1931, Jan., 171; <sup>4</sup>*Presse méd.* 1931, Jan. 24, 116.

**EAR, AFFECTIONS OF.** (*See also* INFANTILE DIARRHOEA—THE RÔLE OF AURAL INFECTION IN.) A. J. M. Wright, M.B., F.R.C.S.

**Injuries of the Ear.**—The increasing frequency of motor accidents has caused attention to be directed to injuries of the hearing apparatus associated with blows to the head. E. D. D. Davis,<sup>1</sup> in opening a discussion on injuries of the ear arising from fractures of the skull, stated that it would be of advantage if, in cases of head injury with deafness, the aurist could see the patient

at an early date. At present the aurist is not as a rule asked to examine such cases until some weeks after the injury, when an accurate diagnosis may be difficult or impossible. The author describes three types of injury as being most commonly met with. These are:—

1. Cases in which hæmorrhage occurs into the middle ear with rupture of the membrane, presumably due to a fracture of the roof of the middle ear. The diagnosis is established by the finding of a middle-ear deafness and a bluish discoloration of the membrane. In the author's experience these cases clear up with no permanent damage to the hearing.

2. Rupture of the membrane, usually in its upper segment, with hæmorrhage from the meatus but without injury of the internal ear.

3. More severe injuries in which a fracture of the base of the skull involves the internal ear and is frequently accompanied by a discharge of cerebro-spinal fluid from the meatus and paralysis of the facial and sometimes of other cranial nerves. These are, in his opinion, usually fatal.

He states that a middle-ear deafness is the most common finding after an injury to the head, and unless it is followed by suppuration, little, if any, permanent loss of hearing results. Any defect in hearing may be expected to clear up in a couple of months, any then persisting being probably permanent.

Tinnitus and vertigo are not uncommon symptoms, but seem as a rule to be due to a cerebral injury rather than to any lesion of the peripheral hearing apparatus. The pre-existence of a middle-ear suppuration increases the liability to meningitis from such injuries, as also does a suppuration as a result of the injury.

**TREATMENT.**—Since the chief risk to life is the onset of meningitis, efforts should be directed towards preventing the entrance of infection and the further provision of drainage should such an infection supervene. Prolonged rest in bed is essential. Syringing or plugging of the meatus should be avoided, the latter being simply wiped over with spirit, and a piece of sterile wool lightly placed in the orifice of the meatus. If suppuration arises, drainage should be promoted, if necessary, by a free incision in the membrane or an opening of the mastoid process, in the latter case care being taken to avoid jarring of the head during the operation. Fractures of the base of the skull may be followed after an interval of months by a fatal meningitis, should an infection of the middle ear occur. The explanation is that union of the fracture takes place by fibrous tissue through which the infection spreads. The occurrence of a nerve deafness, presumably from concussion of the labyrinth but without fracture of the skull, was referred to during the discussion as a not uncommon event.

X rays have proved of doubtful utility in the diagnosis of fractures of the base of the skull. The occurrence of late meningitis after fractures involving the labyrinth is dealt with by F. R. Nager.<sup>3</sup> This risk only exists in cases in which the fracture of the base of the skull has involved the labyrinth, but, as a rule, such fracture has not been accompanied by a rupture of the tympanic membrane. Such fractures through the labyrinth can be diagnosed by the presence of complete nerve deafness with absence of vestibular reactions. In such cases the author advises an early radical operation on the first indication of meningeal irritation.

W. E. Grove,<sup>3</sup> dealing with the ear in head injuries, has found that fractures of the temporal bone involving the base assume two general patterns: (1) The longitudinal fracture, which is by far the more frequent; and (2) A transverse fracture. Longitudinal fractures usually extend into the tympanum, but do not involve the labyrinth. Transverse fractures, on the other hand, take place

through the labyrinth and destroy both vestibular and cochlear apparatuses. They do not usually involve the middle ear, but, should they do so, there is a considerable risk of meningitis supervening. Grove considers that damage may result to the membranous labyrinth or to the auditory nerve from concussion apart from those cases in which the base of the skull is fractured.

**Deafness and Congenital Syphilis.**—The usual 'fistula' symptom, due to a fistula in the external semicircular canal as a result of chronic middle-ear suppuration, consists in the production of a nystagmus by compression of the air in the meatus. In the so-called pseudo-fistula sign of Hennebert, met with in congenital syphilis, the tympanic membrane is intact and no fistula is present, but compression of the air in the meatus in these cases also produces a nystagmus.

N. Asherson<sup>4</sup> investigated fifty cases of congenital syphilis, all of which were under treatment, particularly from the point of view of the presence of Hennebert's sign. He found that even though the cases had received anti-syphilitic treatment for some years, such compression nystagmus was present in 20 per cent of cases, spontaneous nystagmus being also present in some. During his investigation he also noted that the tympanic membrane frequently presented a leaden-blue colour, this discoloration, however, bearing no relation to the presence of the fistula sign. In contradistinction to some other observers, he found that chronic middle-ear suppuration was decidedly uncommon in cases of congenital syphilis, only one of the fifty cases observed showing this condition. He also found that intensive treatment will not necessarily prevent the onset of deafness due to an involvement of the internal ear.

### MIDDLE-EAR DISEASE.

The treatment of infections in the middle ear has, in the past, been somewhat empirical, and it is therefore gratifying to note that attempts are being made to adapt the treatment employed to physiological principles. A. L. Yates<sup>5</sup> has carried out a research into the mechanism of repair of inflammatory processes in the middle ear. He suggests that when such an inflammatory lesion resolves, this resolution is brought about by the bactericidal action of the mucus which is carried away by ciliary action. The cilia are the only means by which mucus is removed from the middle ear, and if these cease to act, as a result either of palsy or desquamation, a chronic inflammation is induced. The important rôle allotted to the mucus would seem to throw doubt upon the advisability of washing it away by syringing, etc.

A. R. Tweedie,<sup>6</sup> working upon similar lines, agrees as to the paramount importance of ciliary action and the secretion of bactericidal mucus in clearing up middle-ear infections. He also suggests that, since the lining of the Eustachian tube takes part in infections of the nasopharynx, the swelling of the lining thus induced may act as an actual mechanical bar to the spread of infection from the nasopharynx to the middle ear. As a result of the recognition of these general principles, he has recently given up the use of douching and watery applications, and employs, instead, ointments composed of vaseline and lanolin or sprays of liquid paraffin.

**Tuberculous Disease of the Middle Ear.**—A discussion on this subject was introduced by F. C. Ormerod and Sir StClair Thomson.<sup>7</sup> StClair Thomson, in his conclusions given below, sums up the present state of our knowledge of this complaint: (1) Tuberculosis of the middle ear is a comparatively rare complication of the infection; it occurs in less than 2 per cent of the cases admitted into a sanatorium. (2) The painless onset of a scanty, thick otorrhœa and marked deafness, in an adult, should suggest a tuberculous origin.

(3) Tubercle bacilli in the aural discharge can be detected in only a minority of cases. (4) Confirmation of a provisional diagnosis should be sought in a careful general examination of the patient (sputum, chest, temperature, X-ray, etc.). (5) This form of otitis media occasionally heals, in certain cases, under simple measures with sanatorium treatment. (6) It is best treated in a sanatorium where a patient could have the benefit of general care as well as such measures as artificial pneumothorax, phrenic avulsion, thoracoplasty, and so forth, which have proved helpful in the treatment of tuberculosis of the larynx. (7) Active local measures are rarely called for, and might be disastrous, because (8) It is a complication which indicates a severe infection. (9) Its discovery justifies a grave prognosis.

Other speakers agreed that tuberculous infection of the middle ear is decidedly uncommon, and it was thought that the condition is more usual amongst children than adults. Middle-ear suppuration in tuberculous children is not by any means always itself tuberculous. While, as has been stated above, operative treatment is usually contra-indicated, in the case of children in which the ear disease may be the most important lesion present, J. S. Fraser advised a radical mastoid with very wide removal of the infected bone.

#### ACUTE SUPPURATIVE OTITIS MEDIA.

**Incision of the Tympanic Membrane.**—The pros and cons for the performance of this operation in cases of acute middle-ear inflammation have received some attention. F. Wanner<sup>8</sup> considers that the operation is done too frequently and on insufficient grounds. He regards a marked defect in hearing as being the most important indication. On taking over the care of a large number of cases of acute otitis media in children, he gave up the routine use of paracentesis which had been previously carried out. He states that since this had been done, complications have not been more frequent and the course of the infection has not been more prolonged or unfavourable.

S. J. Kopetzky<sup>9</sup> advises an incision of the membrane only when it is bulging. When an incision is made, it should be adequate in extent. The fact that an incision heals rapidly shows that there was no tension in the middle ear and therefore that the incision was not needed. He does not find that incising the membrane diminishes the liability to acute mastoiditis, the object of the incision being, therefore, in his opinion, to obtain a better after-result.

J. L. Myers<sup>10</sup> considers that the operation should be carefully carried out by an expert under the best conditions. He states that a faulty myringotomy may give rise to serious complications, particularly if the inner wall of the tympanum is damaged by the knife. To avoid this possibility, general anaesthesia should be employed.

[To sum up: A carefully performed incision in a bulging tympanic membrane will probably diminish pain and shorten the course of the infection. It will not certainly remove the risk of mastoid infection. If not carefully performed, it may do harm, and too early an incision, before the tympanum is distended with fluid, is useless and may be harmful.—A. J. M. W.]

**Otitis Due to the Streptococcus.**—Many observers have reported good results from the use of **Scarlatinal Antitoxins** in acute streptococcal infections. J. M. Alonso<sup>11</sup> relates five cases of acute scarlatinal otitis, in all of which scarlatinal antitoxin apparently arrested the infection and saved the patient's life. Among these cases were two of meningitis, in one of which organisms were isolated from the cerebrospinal fluid. A third case, which seemed to be a hopeless septicæmia, cleared up.

## CHRONIC MIDDLE-EAR SUPPURATION.

**Aural Cholesteatoma.**—The importance of aural cholesteatoma will be understood when it is appreciated that this pathological condition is responsible for a large proportion of the cases of intracranial complications of chronic middle-ear suppuration. It consists in the presence in the middle ear or accessory cavities of a collection of living epidermal cells, which, growing and being shed, form masses which erode the bone and tend to introduce infection into the internal ear or cranial cavity. Exactly why such accumulations take place is not as yet understood. D. McKenzie<sup>12</sup> has carried out a painstaking research into the question of its pathogeny, that is, how the growing epidermal cells get inside the middle-ear cavities. Theories which have been advanced to explain this fall into two groups: those in which the collection is supposed to be due to a chronic suppuration, and those in which the cholesteatoma is regarded as arising independently. Up to the present, the theory that the condition is produced by a chronic suppuration has received the most support, but McKenzie has come to the conclusion that the supposed origin of cholesteatoma from suppuration of the middle ear is an error based upon a misreading of the clinical and pathological data. He has come to the conclusion that the development of the cholesteatoma is primary and that the suppuration is a secondary condition. The clinical importance of this conclusion, if it can be accepted, is that the surgeon's attention should be directed towards getting rid of the cholesteatoma, i.e., of an innocent growth, rather than towards dealing with a chronic suppuration.

W. Döderlein,<sup>13</sup> on the other hand, is convinced that the cholesteatoma is due to an abnormal invasion of the middle-ear from the meatus or tympanic membrane. His views are that two processes take place: first, an inflammatory new growth of epidermic cells, which spreads in the tissues that have been damaged by the inflammatory process; and, secondly, after the inflammation has subsided, the masses of residual epithelial cells take on the form of a cholesteatomatous tumour. He thus blends the two views, regarding the condition as a tumour formation resulting from inflammatory stimulus.

O. Mayer<sup>14</sup> claims to have demonstrated histologically in two cases the actual invasion of the middle ear by the epithelium from the margin of a perforation in the upper segment of the tympanic membrane.

[To sum up: while aural cholesteatoma shows many of the characteristics of a new growth, and in rare cases can be demonstrated to be a primary new growth, in the majority of cases a chronic inflammation does seem to be a primary factor in its causation.—A. J. M. W.]

## COMPLICATIONS OF ACUTE SUPPURATIVE OTITIS MEDIA.

**Suppuration of the Petrous Pyramid.**—Under this title, S. J. Kopetsky and R. Almour<sup>15</sup> have elaborated in great detail a type of acute middle-ear suppuration, which, if untreated, usually ends in meningitis, and which they believe to occur as a definite clinical entity. The degree to which air-cell development takes place in the temporal bone is very variable, and the cases here described only occur in individuals in whom pneumatization has developed to an unusual degree, so that the air cells extend to the tip of the petrous bone and thus surround the internal ear. This anatomical arrangement allows a spread of the infection inwards to the tip of the bone, and it is this spread which explains the clinical type produced. Gradenigo, many years ago, described a syndrome met with in acute middle-ear suppuration, in which trigeminal pain and paralysis of the sixth nerve are found on the side of the lesion (see MEDICAL ANNUAL, 1928, p. 124). This syndrome has been explained

as being due to a spread of infection to the tip of the petrous bone and is therefore pathologically similar to the cases here described. The authors claim, however, that the more serious type here dealt with is more common but has not previously received recognition. While some of the cases associated with Gradenigo's name in the past have ended in meningitis, in the majority the condition has been a benign one.

Petrous suppuration can only occur in cases in which there is a very extensive cell development in the temporal bone, and the existence of such a type of bone can be ascertained by radiographic examination. The course of such cases is briefly as follows: Following an acute middle-ear suppuration, an acute mastoiditis develops, and at operation a widespread infection in a very cellular bone is discovered. The condition of the patient improves and the temperature returns to normal, with cessation of discharge from the middle ear and mastoid wound. After a certain number of days, pain in the eye on the side of the lesion is complained of, accompanied, or followed, by sudden profuse discharge from the middle ear. The patient begins to run a low-grade temperature, and a sensation of dizziness, with some degree of nystagmus associated with labyrinthine irritation, may be observed. A transient facial weakness may also be present. An X-ray picture taken at this stage will reveal distinct pathological changes in the region of the apex of the temporal bone. Operation at this stage will usually result in recovery, but if the lesion is permitted to advance, the eye pain suddenly subsides and is followed shortly afterwards by a fatal meningitis. In some of the cases the suppuration drains spontaneously and the terminal meningitis is replaced by a chronic otorrhœa. Curiously, in none of the authors' cases was paralysis of the sixth nerve (as is present in Gradenigo's syndrome) observed.

The treatment recommended is operative and consists in an attempt at drainage of the infected cells. At operation, a fistulous track can sometimes be identified running inwards towards the tip, and if this is so, this track should be gently curetted and a drain inserted. In cases in which such a track cannot be discovered, the authors have elaborated a special operation to provide drainage, the path chosen running inwards between the cochlea, Eustachian tube, and internal carotid artery. For the exact detail of this operation, readers should refer to the original article. X-ray examination forms a very important part of the diagnosis, and is very thoroughly dealt with by H. K. Taylor,<sup>16</sup> in a separate article.

[There can be no doubt that an extension inwards of the infection in a cellular bone is responsible for the unsatisfactory progress of some cases of acute mastoid infection. The authors are to be congratulated on having defined the symptomatology and for having worked out operative measures to deal with it.—A. J. M. W.]

**Diagnostic Value of Lumbar Puncture in Meningitis.**—A summary of his views has been given by A. B. Rosher.<sup>17</sup> In his experience, it is rare to find organisms on culture in a fluid in which organisms cannot be found in a direct film. At the onset of an intracranial complication, the period which must elapse before changes can be detected in the cerebrospinal fluid is variable, but the shortest interval, in his experience, is three hours. He considers that to obtain the most useful information, examinations of the cerebrospinal fluid should be repeated at intervals of not more than twenty-four hours. As far as examinations of the cerebrospinal fluid are concerned, he recognizes three stages of a meningitis due to infection from the middle ear, i.e., primary, secondary, and tertiary, fully realizing that the inflammatory process may be arrested between each of the stages, especially between the first and second. In the primary or invasive stage, there is a slight increase of cells and protein,

but the percentage of glucose and chlorides remains normal. In the secondary stage (localized meningitis) we get a rapid increase of the polymorphonuclear cells and protein; the organisms appear and the glucose usually diminishes, but the percentage of chlorides remains normal. In the tertiary stage (generalized meningitis) the percentage of chlorides diminishes.

### INTERNAL EAR.

**Ménière's Syndrome.**—Aural vertigo is a most distressing complaint and, by the sense of insecurity which it induces in the patient, is extremely liable to be the cause of a profound neurasthenia. The probability seems to be that, through one of a variety of possible causes, the intra-labyrinthine fluid tension is altered, thus producing an abnormal stimulation of the vestibular apparatus. D. Dederding,<sup>18</sup> in support of this view, has described three patients who were under treatment for Quinke's oedema, affecting, in one case, the pharynx and glottis, and, in the other two, various areas of the skin. All three of the cases were subject to typical Ménière attacks, and his explanation that these were due to an oedema of the labyrinth seems reasonable.

S. H. Mygind and D. Dederding<sup>19</sup> analysed more than a hundred cases of Ménière's syndrome. They noted, in the majority of cases, the existence of cerebral symptoms, such as headache, mental depression, and fatigue, with paresthesia of the fingers and toes and transient paresis of the sixth and seventh cranial nerves. In addition there was some abnormal cell-content in the cerebrospinal fluid in nearly all the cases. They conclude that this combination of cerebral and aural phenomena can be explained by parallel processes, probably consisting of an intracellular oedema, affecting the two underlying liquor systems, cranial and labyrinthine.

**TREATMENT.**—Seeing that in cases of aural vertigo the hearing on the affected side is either very deficient or lost, destruction of the labyrinth by operation would seem to be a rational method of treatment. W. M. Mollison<sup>20</sup> has dealt by operation with eight cases of non-suppurative aural vertigo which had not responded to the usual medical treatment. The operation consists in opening up the mastoid and exposing the external semicircular canal, which is then opened with a fine gouge, and  $\frac{1}{2}$  c.c. of **Absolute Alcohol** is injected forwards along the lumen of the canal into the vestibule. No ill results followed the operation in any of the cases, and in all the vertigo seemed to have been cured. That the results are lasting seems to be shown by the fact that in one case the operation had been carried out as long ago as ten years and no return of the vertigo had been experienced. The author has also employed a similar operation in cases of vertigo existing after the performance of a radical mastoid operation, with equally good results.

J. Remadier<sup>21</sup> confirms this experience that destruction of the labyrinth in cases of vertigo associated with chronic suppuration is both satisfactory and safe. Thus, while operations on the internal ear or auditory nerve designed to relieve tinnitus have, on the whole, been unsuccessful, the symptom persisting in spite of destruction of the end-organ or nerve, in the case of aural vertigo it seems to be established that destruction of the end-organ will produce lasting relief.

**REFERENCES.**—<sup>1</sup>*Proc. Roy. Soc. Med.* 1931, June, 1111; <sup>2</sup>*Acta Oto-laryngol.* xiv, Fasc. 1-2; <sup>3</sup>*Ann. of Otol. Rhinol. and Laryngol.* 1931, March, 222; <sup>4</sup>*Jour. Laryngol. and Otol.* 1931, May, 326; <sup>5</sup>*Ibid.* 1930, Nov., 785; <sup>6</sup>*Proc. Roy. Soc. Med.* 1931, Jan., 327; <sup>7</sup>*Ibid.* May, 953; <sup>8</sup>*Zeits. f. Laryngol.* 1930, May, 349; <sup>9</sup>*Laryngoscope*, 1930, Dec., 924; <sup>10</sup>*Ann. of Otol. Rhinol. and Laryngol.* 1930, Sept., 807; <sup>11</sup>*Rev. Españ. y Amer. de Laryngol.* 1930, March, 104; <sup>12</sup>*Proc. Roy. Soc. Med.* 1931, Jan., 332; <sup>13</sup>*Zeits. f. Hals-, Nasen- u. Ohrenheilk.* xxvi, Heft 5, 530; <sup>14</sup>*Acta Oto-laryngol.* xiv, Fasc. 1-2; <sup>15</sup>*Ann. of Otol. Rhinol. and Laryngol.* 1930, Dec., 996; 1931, March, 157; 1931, June, 396; 1931,



Sept., 922; <sup>16</sup>*Ibid.* 1931, June, 368; <sup>17</sup>*Jour. Laryngol. and Otol.* 1931, April, 236; <sup>18</sup>*Arch. f. Ohren-, Nasen- u. Kehlkopf.* 1930, July, 121; <sup>19</sup>*Acta. Oto-laryngol.* xiv; <sup>20</sup>*Guy's Hosp. Rep.* 1930, Oct., 470; <sup>21</sup>*Ann. d' Oto-laryngol.* 1931, Jan.

### ECHINOCOCCAL CYSTS OF THE LUNG.

A. Tudor Edwards, M.Ch., F.R.C.S.

J. Abadie,<sup>1</sup> of Oran, records 10 cases of echinococcal cysts in the lung in which surgical intervention has been undertaken. In 6 of the cases adhesions of the lung to the chest wall were present, and operation, consisting of incision and removal of the lining membrane, was done in one stage, and was followed by drainage. In 4 cases the pleura was free. In the first, after thoracotomy the cyst in the middle lobe was evacuated by an aspirator, the membrane was removed, but attempts to attach the lung to the chest wall were followed by marked cyanosis. The chest was therefore closed without drainage. Fourteen days later the pleura was drained of a very offensive collection of pus. In the second case the cyst was opened, aspirated, and the membrane removed, the pulmonary pocket was drained through the chest wall, and the chest closed without pleural drainage after aspiration of the air. The third case was treated in a similar way, but both pleura and lung were drained. Apart from an attack of tension pneumothorax, relieved by aspiration, convalescence was uninterrupted. The fourth was similar to the third. All these cases recovered. Abadie states that diagnosis depends upon radioscopy. He also emphasizes the danger of aspiration of these cysts through the unopened chest, having seen one death and one serious heart-failure occur during this procedure. As regards operative indications, he states that: (1) Non-infected central cysts should be left alone; (2) Central infected cysts should be operated upon in spite of risks; and (3) All peripheral cysts, infected or non-infected, should be subjected to operation.

J. D. Daniljak and A. A. Stuss<sup>2</sup> record 20 cases grouped as follows: Interstitial cysts, 7; cysts which erupted into the bronchus, 7; infected cysts, 3; cysts which burst through the liver into the lung, 3. The patients consisted of 6 women and 14 men, varying in age from 15 to 58 years. Eleven cases were cured by operation. Of 3 patients with infected cysts, which broke through into the lung and pleura, 2 died twelve to twenty days after operation. The third patient was cured after operation.

Daniljak and Stuss say the diagnosis is made on the history of the illness, the clinical picture, the radiological examination, and the positive blood and skin reactions. Small central cysts should generally not be operated upon. Those cysts in the neighbourhood of the visceral pleura should be subjected to operation, and all operations should be done under positive pressure anaesthesia.

REFERENCES.—<sup>1</sup>*Bull. et Mém. Soc. de Chir.* 1931, Feb. 7, 124; <sup>2</sup>*Arch. f. klin. Chir.* 1930, Oct., 633.

### ECTOPIA VESICÆ. (See BLADDER, ECTOPIA AND EXTROVERSION OF).

### ECZEMA.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

**Infantile Eczema.**—G. W. Bamber<sup>1</sup> has published his observations on fifty cases of infantile facial eczema which he has studied in great detail. He has also surveyed the literature of the subject very completely. The relationship of this condition to Besnier's prurigo (or, as it is frequently called, 'flexural eczema') and to asthma is fully discussed. His conclusions are as follows: (1) The higher incidence of facial eczema in male infants (3:1) is considered to be against an external factor being the chief cause. (2) The initial lesion is either an erythemato-urticarial reaction or a primary pruritus. (3) Fat

babies are more likely to be affected. (4) The onset and exacerbations are often associated with gastro-intestinal disturbances and with asthma. (5) A family history of some allergic manifestation is not uncommon. (6) Some constitutional peculiarity of the infant is probably the most important factor determining the development of eczema. (7) Of external factors cold weather and variations in temperature are the most important; infection of the skin is neither constant nor necessary. (8) Besnier's prurigo is preceded, immediately or more remotely, by infantile facial eczema in more than half the cases examined; transitions from one to the other are seen. (9) The infantile and the family history of the children with Besnier's prurigo is similar to those of eczematous infants. The same constitutional peculiarity probably underlies both.

REFERENCE.—<sup>1</sup>*Brit. Jour. Dermatol. and Syph.* 1931, June, 279.

**ELECTROCARDIOGRAPHY.** (See ARRHYTHMIA AND ELECTROCARDIOGRAPHY.)

**ELEPHANTIASIS.** (See FILARIASIS.)

**EMBOLISM, PULMONARY.** (See POST-OPERATIVE COMPLICATIONS.)

### EMPHYEMA.

*A. Tudor Edwards, M.Ch., F.R.C.S.*

The recognition of the main types of infected pleural effusions—the localized abscess and the general effusion, often synpneumonic—is becoming more general, with a great improvement in the mortality figures. The other feature is the acceptance of the necessity for negative pressure drainage and, generally, of irrigation with suitable precautions.

L. C. Foster,<sup>1</sup> in a report of 153 consecutive cases of empyema, emphasizes the value of negative pressure drainage after rib resection. This is postponed until the pulmonary lesion has subsided, the vital capacity is nearly normal, and adhesions between parietal and visceral pleuræ stabilize the intrathoracic organs. Adequate drainage at the correct moment prevents gross pleural thickening and rigidity of the cavity wall, which militates against re-expansion of the lung and obliteration of the cavity. The total mortality in this series is 11·1 per cent, with a further reduction to 7·2 per cent in the last 83 cases.

E. L. Keyes<sup>2</sup> discusses the treatment of bilateral empyema and advocates treatment of both sides simultaneously—that is, at the period when aspiration is advisable this should be carried out on both sides, and similarly when rib resection is indicated the operations should be done within a few hours on both sides. He adduces both physiological and clinical evidence to support his thesis. Physiological evidence shows that both pleural cavities can be considered as one as regards interference with intrapleural pressures, and therefore if both openings are not larger than a certain size there is a margin of safety. Clinically, he records 11 patients who have had simultaneous thoracotomies on both sides without death in the twelve days following operation, and another 42 patients with almost simultaneous thoracotomies, all of whom recovered. A review of patients in whom operation on the second side has been deferred for several days shows that the improvement after the first operation is slight, and it is not until the second side is opened that real progress is made.

Hausmann<sup>3</sup> records results in 27 cases of empyema, 21 resulting from streptococcal infection. Five of these were treated with repeated aspiration, with 4 recoveries, and death in one in which the infection was bilateral. Twenty-two were treated by siphon drainage, of whom 19 recovered. Further

operation was required in 3 patients, and should be instituted when fibrinous masses interfere with evacuation, when encapsulation occurs, in cases with pulmonary shrinking with cardiac displacement, and when pleuropulmonary fistula or interlobar exudates are present.

Morrison Davies<sup>4</sup> stresses the value of preliminary aspiratory treatment of streptococcal infections of the pleura and emphasizes the differences between this type and that resulting from pneumococcal pneumonia. The physiological and pathological reasons for the different types of treatment are included in the paper, and suction drainage is advocated at the appropriate moment. [The value of this measure is becoming generally recognized by all those interested in the surgery of empyema, and the method for its maintenance is gradually being simplified.—A. T. E.]

F. J. Hathaway<sup>5</sup> advocates the open operation for pneumococcal empyema. The empyema cavity is completely emptied of all contents, including fibrin, dried by swabs, and completely closed. Subsequently, re-collections of fluid in the cavity are evacuated by inserting sinus forceps through the operation wound. [Obviously, this method should be reserved for pneumococcal cases, as it is likely to lead to disaster in streptococcal cases.—A. T. E.]

REFERENCES.—<sup>1</sup>*Ann. of Surg.* 1930, Aug., 212; <sup>2</sup>*Ibid.* 1931, May, 1050; <sup>3</sup>*Jour. Amer. Med. Assoc.* 1931, June 6, 2004; <sup>4</sup>*Brit. Med. Jour.* 1931, i, 569; <sup>5</sup>*Practitioner*, 1930, Aug., 335.

### EMPYEMA IN CHILDREN.

*John Fraser, Ch.M., F.R.C.S.Ed.*

TREATMENT.—The problem of the best method of treating empyema, and particularly that form which affects young children, has been widely discussed, and it is significant that no unanimity of opinion is revealed. As with so many other problems of surgical procedure, there is general agreement on certain points and wide divergence on others. It is agreed that, when a diagnosis of pus in the pleural cavity is made, evacuation by aspiration should be the first method of choice; the difference of opinion arises when a decision has to be arrived at as to the procedure if simple aspiration fails. F. Jamin<sup>1</sup> has no doubt that rib resection with appropriate subsequent drainage is the proper course. This recommendation will come as a surprise to most readers, for the consensus of opinion to-day is against such interference. Jamin is in no doubt about the matter, however, and, after criticizing treatment by repeated aspiration, and by thoracotomy with suction, he says, "It is evident that the boldest treatment (rib resection) gives the best results", adding, "the issue of the illness depending rather on the absence or otherwise of complications than on the choice of intervention." The latter statement seems equivocal, and is certainly not conclusive so far as the claims for rib resection are concerned.

Jamin's routine is as follows: After localization of the empyema, he attempts to empty the collection as completely as possible by aspiration. He then injects 10 c.c. of a weak iodine solution and awaits events; if effusion recurs and continues, and there is a persistence of temperature, he carries out a rib resection. The statement concludes as follows: "With young children the treatment of empyema must aim at rapid and thorough drainage of the effusion by means of thoracentesis or thoracotomy." In the light of other opinion, rib resection in children meets with condemnation, and yet Jamin records results which certainly bear comparison with those afforded by other methods. Can it be, as Jamin says, that it is not the method which matters, but rather the absence or otherwise of complications?

G. Noeggerath<sup>2</sup> has published what he calls a simplified treatment of empyema in children. The records of 56 cases are given; 22 of them were

used as controls, in so far as they were treated by means other than those Noeggerath recommends, and 34 were treated on the author's approved plan; the patients were children of 12 years of age and under. The method is simple, but entails nothing new. In fact, it is a reversion to a procedure which Hippocrates recommended. The method is that, when treatment by repeated aspiration fails, an intercostal thoracotomy is done under local anaesthesia, the muscles are detached from the under-surface of the rib above, and through the opening so made a rubber drain, closed at one end by a Jean's clamp, is introduced. So far as possible, no air is allowed to enter the pleural space, and as soon as the tube is *in situ* the outer end is covered with a large quantity of protective dressing. The after-treatment entails frequent changing of the outer portion of the dressing, but the deeper portions are left mostly undisturbed until the tube requires to be shortened. The results show a mortality of 12.5 per cent, a figure which contrasts favourably with those of other methods. They are certainly better than those obtained by Jamin; his mortality in 96 cases totalled 30.3 per cent, with a mortality of 57 per cent in 42 cases under two years of age.

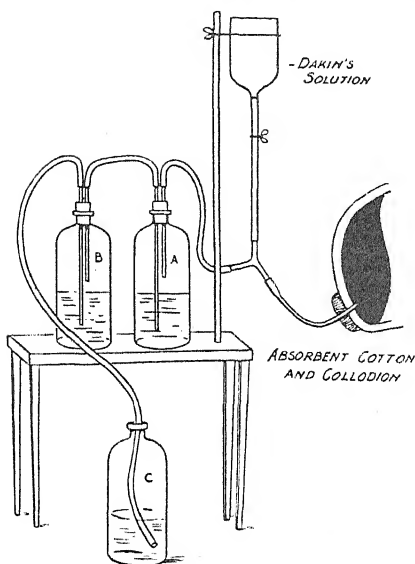
In German circles there is evidently a tendency towards the re-adoption of rib resection, and the advantages are discussed by J. Erdely.<sup>3</sup> In his technique a gradual decompression is the distinctive point. Following a test puncture, 8 cm. of the eighth rib are removed in the mid-axillary line, the cut surfaces of the rib are treated with antiseptic, the periosteal-lined cavity which remains is packed with vaseline gauze, and the surrounding skin covered with a thick layer of 2 per cent zinc sulphate ointment. At this point the patient is returned to bed, and attention is concentrated on improvement of the general condition. Twenty-four hours later the wound packing is removed, the pleuro-periosteal bed punctured, and 100 c.c. of pleural fluid are withdrawn, the packing being thereafter replaced. On the following day the process is repeated, and double the quantity of fluid is withdrawn. On the third day the pleura is opened by an incision 1 cm. in length, and on the fourth day the pleural wound is enlarged throughout the length of the original skin wound. A free escape of pleural fluid is now encouraged, and as fibrin clots appear in the pleural wound they are released. No particular type of drainage is employed, the discharge being allowed to accumulate on a copious dressing.

Six cases of empyema in infants under 2 years were treated in this way; five recovered, but the sixth, an infant 1 year old, succumbed from a pneumonic process of the contralateral lung and a purulent pericardial affection so serious that recovery was never anticipated. So far as we are aware, this is the first time that a multiple-stage thoracotomy has been described; in the principle which underlies it there is much that is sound, and the mortality figures bear favourable comparison with those of other methods.

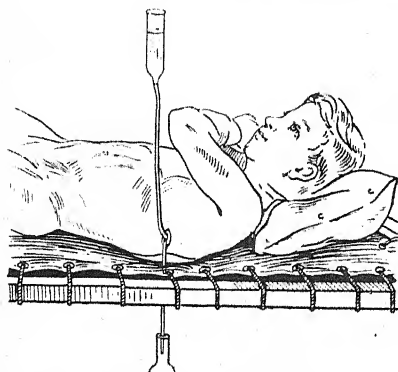
The paper read by J. D. McEachern<sup>4</sup> at the meeting of the British Medical Association at Winnipeg in August of last year attracted considerable attention. The results of 42 cases were presented, and the mortality figure of 2.38 per cent was probably the lowest ever recorded in this class of case. The age period ranged from 4 months to 11 years, 50 per cent of the children being under 4 years. McEachern accepts three principles as essential in the treatment of the disease: (1) A sufficient delay to ensure the formation of adhesions; (2) The use of irrigation; and (3) The provision of a negative pressure by means of a type of continuous suction. The thoracotomy is carried out under local anaesthesia, and is intercostal in type. In infants and children a catheter, No. 16 or 18 (French), is inserted through a trocar between the ribs, the trocar being then withdrawn. The opening around the catheter is sealed by successive layers of absorbent cotton saturated with collodion until a collar

about 5 in. in diameter and  $\frac{1}{2}$  in. in depth is built up around the tube. When the protective collar is sufficiently dry, a clamp, which hitherto closed the catheter opening, is removed, drainage is begun, and twenty-four hours later intermittent irrigation with Dakin's solution is commenced. The system by which the irrigation is secured is shown in *Fig. 19*. McEachern's results are so outstanding that the method is worthy of a thorough trial.

Denis Browne<sup>5</sup> is an advocate of the catheter drainage and irrigation method. Under local anæsthesia the pleural cavity is entered through the intercostal route, a pleural opening about an inch long is made, and through the space two Pezzer's catheters are introduced side by side. The wound space is packed with gauze soaked in liquid paraffin. One of the catheters is used for irrigation purposes, the other is the means of drainage, and to facilitate the latter aim the child is nursed upon a canvas frame, which has an aperture through which the drainage catheter passes into a collecting bottle containing antiseptic (*Fig. 20*). Following the insertion of the catheter drainage is continued for several hours, and thereafter intermittent irrigation with Dakin's solution



*Fig. 19.*—Illustrating closed drainage of empyema. To irrigate the cavity the rubber tube connecting the Y glass connection with bottle A is clamped, after which the clamp is removed from the tube connecting the Y with the container for Dakin's solution; when the abscess cavity is filled the solution is clamped off and the clamp between the Y connection and bottle A removed, allowing the solution to drain off by suction into bottle A. To remove the solution accumulated in bottle A, clamp both rubber tubes leading from the glass connections in the cork; the cork may then be withdrawn and the bottle emptied without disturbing the siphon. (Redrawn from the 'British Medical Journal'.)



*Fig. 20.*—Drawing to show method of drainage. (Re-drawn from 'The Lancet'.)

(105°) is carried out. This routine is continued until the temperature has been normal for several days; the child is then allowed to get out of bed, and breathing exercises with James's bottles are begun. The irrigation catheter is removed when estimation of the size of the cavity shows it to be less than 10 c.c. No statistics accompany Browne's paper.

These papers show the difficulty there is in appreciating what is the most efficient method of treating empyema, especially in young children. The work of Graham and others has established certain principles which are accepted as

essential in the treatment of the diffuse streptococcal empyema. We recognize the danger of an open pneumothorax with its risk of mediastinal mobilization, and it is a rule in universal acceptance that the diffuse empyema shall be treated by aspiration, either throughout, or until a localized abscess appears. But how are we to deal with the localized collection? In the papers under review the three standardized methods of rib resection, simple thoracotomy, and trocar thoracotomy with suction drainage are recommended by their various sponsors, and in each instance good results are claimed. One cannot help feeling that rib resection may cause unnecessary shock in children, and that any benefits which it may have are secured by the less distressing procedure of intercostal thoracotomy. Whether the intercostal route shall be entered by puncture or by deliberate open incision is a more debatable point. When puncture is employed, the existence of fibrinous clots necessitates the use of an irrigant solution if repeated tube blockage is to be avoided, and, with this condition fulfilled, there is no doubt that the results, as shown by McEachern, are excellent. Simple thoracotomy, using a copious dressing to collect discharge, has certain advantages, but the constant discharge makes nursing difficult, while the arrangement undoubtedly encourages the persistence of an open pneumothorax, unless peculiar care is taken. All things considered, a method which provides a closed drainage combined with intermittent irrigation appears to offer the best solution of the problem. Erdely's multiple-stage operation presents certain advantages, and no doubt opportunity will be taken to put this method to a wider test than it has previously had.

REFERENCES.—<sup>1</sup>*Deut. Zeits. f. Chir.* 1930, Nov. 1, 164; <sup>2</sup>*Münch. med. Woch.* 1931, lxxviii, 303; <sup>3</sup>*Zentralb. f. Chir.* 1930, Nov. 20, 2982; <sup>4</sup>*Brit. Med. Jour.* 1931, i, 389; <sup>5</sup>*Lancet*, 1930, ii, 733.

### ENCEPHALITIS, EPIDEMIC.

J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—According to the Monthly Epidemiological Report of the Health Section of the League of Nations,<sup>1</sup> encephalitis lethargica has shown a marked decline during 1929 and 1930. Since the initial epidemic and its recurrence in 1924–5 the morbidity and mortality have diminished in all European countries and also, though more slowly, in the United States. Japan was the only country where serious epidemics occurred in 1926 and 1929, but these two epidemics were less severe than that of 1924. The epidemic of August and September, 1929, affected about 2000 persons, as compared with 6551 in 1924, and caused more than a thousand deaths, with a total fatality-rate of 52·8 per cent. The countries most affected by encephalitis lethargica in 1929 were Denmark (3·9 per 100,000 population), Scotland (3·2 in the towns), England and Wales (2·6), Sweden (2·2), and Czechoslovakia. Outside Europe the morbidity-rate amounted to 1·7 for New Zealand and 3·2 for Japan. The seasonal influence on the prevalence of the disease was formerly very marked in Europe, epidemics always occurring during the first two or three months of the year, but since 1925 this seasonal distribution has shown a tendency to disappear.

Under the name of *epidemic serous meningitis* E. Eckstein<sup>2</sup> describes a disease which has been remarkably prevalent in recent years, and does not resemble any of the ordinary forms of cerebrospinal affection. In addition to the ordinary clinical signs of meningitis the cerebrospinal fluid on lumbar puncture is almost always under increased pressure, but clear and sterile. Gunther has collected 100 examples of this condition from the literature between 1906 and 1928, and Eckstein saw 13 cases of the kind at the Dusseldorf Children's Clinic between May and October, 1930, 6 of which came from a single suburb. Eckstein agrees with Stoois in not regarding them as cases of poliomyelitis, as

no examples of that disease occurred at the same time in Dusseldorf, and is of opinion that epidemic serous meningitis is either an abortive form of epidemic encephalitis or an independent disease.

In an article on *sporadic encephalitis* R. Citron, R. Seidmann, and J. Zappert,<sup>3</sup> who report forty-two examples, which occurred in their hospital and private practice in Vienna during the period 1920-9, suggest that the virus of encephalitis, in addition to causing an extensive epidemic, also has a special affinity for certain parts of the brain, involvement of which gives rise to sporadic encephalitis. This hypothesis would explain the occurrence of numerous cases of encephalitis after the epidemic had subsided.

**SYMPTOMS AND COMPLICATIONS.**—P. B. Bland and L. Goldstein,<sup>4</sup> who report a case of *Parkinsonism in pregnancy* with a review of the literature, come to the following conclusions: Chronic epidemic encephalitis does not render a woman sterile, and the incidence of abortions in patients who conceive is about the same as in other women. Pregnant women are not specially susceptible to the infection of epidemic encephalitis. Clinically the disease pursues much the same course in the pregnant as in the non-pregnant woman, although the mortality-rate is somewhat higher in the former. Pregnancy may aggravate latent or quiescent encephalitis in patients who have previously suffered from the disease. Women who contract acute encephalitis in pregnancy are especially liable to develop Parkinsonism, the incidence being from 75 to 80 per cent, as compared with 25 per cent in the non-pregnant woman. Except in a small proportion of cases, chronic encephalitis does not have an unfavourable influence on pregnancy and labour. On the other hand pregnancy has a decidedly unfavourable effect on Parkinsonism. Lastly, although encephalitis may be transmitted to the fœtus, such transmission is exceedingly rare.

**PROGNOSIS.**—H. A. Howe<sup>5</sup> records his observations on 66 children who were examined at periods ranging from 1 to 10 years after the onset of epidemic encephalitis. The immediate mortality was 11 per cent, complete incapacity was found in 19 per cent, partial incapacity in 22 per cent, and recovery in 42 per cent. The sequelæ were divided into progressive and non-progressive, the former including hyperactivity, sleep inversion, changes of personality, hyperpnœa, and ties; and the latter, paralyses, choreiform movements, emotional instability, and mental retardation. The non-progressive sequelæ, with the exception of mental retardation, had a good prognosis, while the outlook of progressive sequelæ was unfavourable.

**TREATMENT.**—According to G. A. Borthwick,<sup>6</sup> who records his observations at the Encephalitis Lethargica Unit at the Northern Hospital of the London County Council, hypodermic injections of **Hyoscine Hydrobromide** cause much improvement in the patient's condition, particularly in the muscular rigidity and slowness of movement, and considerably reduces the tremor of Parkinsonism.

Various forms of **Physiotherapy** have also been employed, such as callisthenic exercises, massage, and active and passive movements after bathing.

**REFERENCES.**—<sup>1</sup>*Monthly Epidem. Rep. Health Sect. League of Nat.* 1930, 329; <sup>2</sup>*Klin. Woch.* 1931, 22; <sup>3</sup>*Arch. f. Kinderheilk.* 1930, xci, 39; <sup>4</sup>*Jour. Amer. Med. Assoc.* 1930, xcvi, 473; <sup>5</sup>*Bull. Johns Hopkins Hosp.* 1930, xlvii, 123; <sup>6</sup>*L.C.C. Rep.* 1931, No. 2811, 13.

Macdonald Critchley, M.D., F.R.C.P.

**Treatment with Harmalol Hydrochloride.**—In the MEDICAL ANNUAL for 1931 (p. 173) attention was drawn to the action of the two alkaloids-harmine and harmaline in the treatment of post-encephalitic states of Parkinsonism. L. Halpern<sup>1</sup> suggested that the pharmacological action of these drugs comprised an excitant effect on the cells of the cerebral cortex. J. A. Gunn<sup>2</sup> and

his co-workers have found experimentally that whereas harmine and harmaline produce clonic convulsions in laboratory mammals, harmol and harmalol (which differ in the substitution of an HO for a  $\text{CH}_3\text{O}$  group) have no convulsive effect. It seems reasonable to expect, therefore, that harmalol would prove ineffective in the treatment of post-encephalitic rigidity if Halpern's view be correct.

H. Astley-Cooper and J. A. Gunn<sup>3</sup> therefore treated a series of patients with post-encephalitic syndromes by means of harmalol hydrochloride (Boots) given hypodermically or by mouth. In the former case, doses of  $\frac{1}{5}$  gr. were used; in the latter 8 to 12 gr. There resulted a slight but definite reduction in the degree of rigidity. No benefit was observed in the tremor, the salivation, or in the general comfort of the patient. It did not produce anything like so complete a relief of all the symptoms as is effected by the alkaloids of the hyoscyne group. In this way harmalol resembles closely the effects of harmine, a fact which rather belies Halpern's view as to the mode of action. Harmalol, it is thought, may prove of service as an adjuvant to hyoscyne or stramonium therapy.

REFERENCES.—<sup>1</sup>*Deut. med. Woch.* 1930, lvi, 651, 1252; <sup>2</sup>*Quart. Jour. Pharm. and Pharmacol.* 1929, ii, 525; 1930, iii, 1, 218; 1931, iv, 44; <sup>3</sup>*Lancet*, 1931, ii, 901.

#### ENCEPHALITIS, POST-VACCINAL. (See VACCINATION.)

#### ENDOCARDITIS, INFECTIVE.

A. G. Gibson, M.D., F.R.C.P.

W. E. Thayer<sup>1</sup> in the Gibson Lectures for 1930 gives from his immense experience an illuminating account of bacterial or infective endocarditis. Some of the conclusions are as follows: By far the commonest organism is the streptococcus, with over 60 per cent; the next is the pneumococcus, with just under 15 per cent. Classifying the length of the illness, those cases due to the influenza bacillus most frequently last longer than two months, though an overwhelmingly large proportion of streptococcal cases also last longer than two months. Only 5 per cent of the cases of pneumococcal infection last over two months, and only 18 per cent of those due to *Staphylococcus aureus*. Pre-existing valvular disease is present in 100 per cent of cases of influenzal infection, just over 70 per cent in streptococcal infections, and just over 40 per cent in staphylococcal infections. It is present in 35 per cent of pneumococcal and 14 per cent of gonococcal infections. The more acute types of streptococcal infections are due to  $\beta$  hæmolytic streptococcus, whereas the more chronic are due to *Streptococcus viridans*. The valves affected are compared in the different etiological groups and with rheumatism, and it is interesting to note that the valve affected in pneumococcal and gonococcal infections is more commonly the aortic than any other. In an examination of the incidence in the white as compared with the negro race the streptococcus heads the list as regards the white race and the pneumococcus is more prevalent in the negro.

In regard to recovery from these infections, Dr. Thayer remarks that he has seen but three apparent recoveries from subacute streptococcal endocarditis, but he has never seen recovery when there has been persistent grave and repeated embolism. An interesting chart shows the average leucocyte count in the different infections. It is highest in the pneumococcus, and the series descends as follows: gonococcus, staphylococcus, streptococcus acute, rheumatism, streptococcus subacute, to influenza with an average of 10,000.

The picture of subacute vegetative endocarditis, though commonly seen with streptococcal infections, is also occasionally seen with gonococcus, staphylococcus, and *B. influenzae*, very rarely with pneumococcus or *Sta. aureus*.

Influenzal infections are in general milder and slower in development.



Petechiæ were noted in one-third, and the spleen was palpable in two-thirds. Clubbing of the fingers occurred in 44 per cent.

Pneumococcal endocarditis is an acute and rapidly fatal process, more common in middle and later adult life, and terminates usually within four weeks, often being hastened by meningitis.

Gonococcal endocarditis is an acute destructive process affecting the aortic valve, and occasionally the valves of the right side. It may last several months, the intoxication is unusually profound, the fever high and often associated with rigors. Anæmia is a striking feature. Patients usually die, but recovery occurs rarely.

*Sta. aureus* infections usually accompany osteomyelitis, carbuncle, or puerperal sepsis, and are frequently so rapid as not to be recognized during life. Pre-existing rheumatism or syphilis plays no important part. The disease tends to be clinically more like a pyæmia with multiple foci of suppuration. Endocarditis from *Sta. albus* gives on the whole a clinical picture of subacute endocarditis with a relatively rapid course.

REFERENCE.—<sup>1</sup>*Edin. Med. Jour.* 1931, April, 237, 307.

**ENDOCRINOLOGY, RECENT ADVANCES IN.** (*See also* GOITRE; HYPERINSULINISM; HYPERTHYROIDISM; PARATHYROID GLANDS; PITUITARY GLAND; SUPRARENAL GLANDS.) *W. Langdon Brown, M.D., F.R.C.P.*

Just ten years ago the present writer reviewed the position of endocrinology at that time. It seems appropriate in this Jubilee number to summarize quite briefly the principal advances made during the decade that has intervened.

Three entirely new hormones have been isolated—insulin, œstrin, and parathormone. The thyroid hormone, thyroxin, has been obtained in a crystalline form and synthetically prepared. Pituitrin has been shown to contain two distinct substances—pitressin, which raises the blood-pressure, and oxytocin, which contracts the uterus. So that on the purely biochemical side great advances have been made. Clinically, the discovery of insulin has revolutionized the prognosis and treatment of diabetes, has clarified our views on many of the endocrine interactions, and has proved a valuable help in the treatment of hyperthyroidism, hepatic toxæmias, and various wasting diseases. Parathormone has proved of great practical value in the treatment of tetany, and has played an important part in the recognition of hyperparathyroidism. Oestrin has been of limited use clinically, but evidently technical difficulties have still to be overcome before its extended use is practicable. Active extracts have been prepared from the anterior lobe of the pituitary and from the adrenal cortex, though these have not as yet proved capable of much clinical application.

The revival of **Iodine Therapy** in hyperthyroidism by Plummer in 1922 has been of great service, though many observers would limit its application to the periods before and after operation, regarding it as in no sense curative. Nevertheless, its early use, combined with other medical treatment, seems to have prevented a number of cases reaching the stage at which operation would have been inevitable. Operation for hyperthyroidism has grown greatly in esteem, but it must be emphasized that the low mortality-rates often quoted to-day are only obtained by those surgeons specially skilled in performing the operation. In other hands the procedure still remains a dangerous one. It is interesting to observe that the operation has specially grown in favour for cases where cardiac decompensation, including auricular fibrillation, has developed—that is, in just those cases which were formerly regarded as outside the sphere of surgery. Here the results of operation are astonishingly good, while medical treatment alone cannot hope to stabilize such patients. The operation of election is subtotal **Thyroidectomy**, though in highly toxic cases a preliminary

ligation of the arteries to the gland is still practised. The method of anaesthetization of the patient is of great importance; G. L. Keynes recommends rectal avertin before the patient is moved from the bed, followed by local anaesthesia, supplemented by gas and oxygen if necessary. The question of 'toxic adenomata' has been much discussed, and it is generally agreed, following Dunhill, that they are not true new growths but hyperthyroidic changes occurring in a previously damaged gland. It is better, therefore, to speak of such cases as 'secondary Graves' disease.' The damaging effect of such a condition on the heart is explained by its occurrence in later life when the cardiac reserve is not so great as in youth. It is certainly a striking fact that in earlier life a large diffuse hypertrophy of the gland will injure the heart less than will a comparatively localized 'adenoma' later on.

The rôle of the parathyroids in the metabolism of calcium and phosphorus has been put on a sound foundation, and the clinical entities of hypo- and hyperparathyroidism have been established. But this subject is fully reviewed elsewhere in this volume (see PARATHYROID GLANDS).

Valuable additions have been made to our knowledge of the pituitary body. The work of P. E. Smith and of Evans and Simpson have made clear its influence on growth (through the eosinophilic cells in the anterior lobe), on sex (through the basophilic cells in the same lobe), and on fat metabolism (through the associated action of the posterior lobe and overlying diencephalon). Cushing's work has shown the close connection between this gland and the emotional nervous system.

The close association and interactions between the pituitary and the gonads has been the subject of much research. The work of Dixon and Marshall deserves special mention. They showed the stimulating effect of œstrin on the secretion of pituitrin, and the antagonizing influence of the luteal hormone on this until the onset of parturition, when the corpus luteum begins to degenerate, releasing the œstrin, with a consequent flow of the oxytocic principle into the cerebrospinal fluid. Taking this into conjunction with other work, we may say that an anterior pituitary hormone stimulates the production of œstrin, which increases the secretion of the post-pituitary hormone, which in its turn stimulates uterine contraction. The introduction of the vaginal smear test in rats has provided a method for the detection of œstrin, and has shown how widely distributed this hormone is elsewhere than in the ovary, e.g., in the placenta and urine of pregnancy.

The work of Stewart and Rogoff has led us to attribute a larger share to the adrenal cortex in the pathology of Addison's disease, while Achard and Thiers and others have added to our knowledge of the similarity of the virilizing effects of tumours of the adrenal cortex and of basophilic adenomas of the anterior pituitary.

The evidence for the existence of status lymphaticus as a clinical entity has been seriously criticized, and a more critical attitude has been adopted towards the indiscriminate use of polyglandular extracts without due consideration of the physiological principles involved and the pharmacological evidence.

A striking feature of the recent work has been the way in which new facts have dropped into their place like the pieces of a jig-saw puzzle. This is encouraging as showing that we are proceeding along the right lines. The past decade has been rich in achievement and is full of promise for the future.

## ENDOMETRIOSIS.

*Beckwith Whitehouse, M.S., F.R.C.S.*

The occasional existence of tissue having the characters of endometrium in the ovary, on the surface of the uterus, in the recto-vaginal septum, and elsewhere is now generally recognized. Various contributions have been made

during the last few years towards the pathology of this interesting condition, but comparatively little has been published regarding the clinical details. The reason for this probably lies in the fact that no one individual meets with a sufficient number of cases in one year to form the basis of an authoritative statement, and as in other uncommon lesions time is necessary in order to accumulate the necessary material.

F. E. Keene and R. A. Kimbrough<sup>1</sup> have recently analysed from the clinical point of view 118 cases of endometriosis admitted to the University Hospital of Pennsylvania. Because of the wide variation in the pathological types, cases are best divided into three main groups: (1) Intraperitoneal endometriosis, the most common form, including lesions of the ovaries, tubes, intestines, and pelvic peritoneum; (2) Adenomata of the recto-vaginal septum; (3) Endometriomata of the umbilicus or laparotomy scars. In the writers' series, the distribution of endometrial tissue was as follows: ovary 110; recto-vaginal septum 6; umbilicus 2; laparotomy scar 1.

**1. Intraperitoneal Endometriosis.**—The presence of *complicating disease* is a striking feature of the condition, and this naturally complicates the symptomatology. Thus uterine fibroids were found in 55.4 per cent, chronic salpingitis in 20 per cent, and adherent retroflexion of the uterus in 14.5 per cent. W. W. King<sup>2</sup> has drawn attention to the same fact, reporting fibroids in 22 per cent, adherent retroversion in 21 per cent, and evidence of pelvic inflammation in 39.7 per cent of his cases. Endometriosis is nearly always a disease of active sexual life, only two of Keene and Kimbrough's patients having passed the menopause. The youngest patient was 22 and the oldest 60.

**SYMPTOMS.**—*Sterility* is generally a prominent symptom, partly owing to the lesion itself and partly from the complicating lesions. Seventy per cent of the women in the present series were married, with a sterility figure of 40.9 per cent.

It might be expected that menstrual anomalies would figure largely in the symptomatology, but in point of fact it appears that ovarian endometriomas *per se* produce very little alteration in menstruation.

*Menorrhagia* was certainly present in 44 per cent of the cases investigated, but since fibroids were also present in 32 of the 48 patients showing menorrhagia, in only 16 could the symptom be ascribed to ovarian dysfunction. This is in accordance with the observations of others (W. W. King,<sup>2</sup> A. Donald,<sup>3</sup> G. V. Smith,<sup>4</sup> and J. W. Shirer<sup>5</sup>), and one must conclude, therefore, that profuse menstruation is a symptom of the complicating lesion rather than of the endometrioma itself.

*Dysmenorrhœa*, on the other hand, is commonly present. In Keene's series menstrual pain occurred in 60 per cent of cases, being usually premenstrual and persisting during the first day or two of the function. Donald<sup>3</sup> noted menstrual pain in 70 per cent of his patients, being of the acquired type in 50 per cent. Both Smith<sup>4</sup> and King<sup>2</sup> record similar observations, the latter noting *rectal pain during menstruation* as being a prominent feature in 75 per cent of cases of endometriosis involving the recto-vaginal septum.

*Intermenstrual discomfort*, or actual lower abdominal or pelvic pain, is not uncommonly present, and is naturally exaggerated at the time of menstruation.

*Dyspareunia* is also a symptom of many patients. Donald, in his series of 40 cases, records it as prominent in 57 per cent.

The symptoms taken as a whole vary widely in degree and kind, depending mainly upon the extent of the lesion, involvement of adjacent structures, and the complications that so commonly co-exist. The following symptom-complex may, however, be regarded as representative of a typical case and prove useful in diagnosis: (1) Age, between 25 and the menopause; (2) Sterility, absolute

or relative; (3) Abnormal menstruation, usually menorrhagia; (4) Dysmenorrhœa of the acquired type; (5) Dyspareunia; (6) Sacral backache; (7) Intermenstrual lower abdominal pain, with increased discomfort during menstruation; (8) Pain in the rectum or bladder which bears a distinct relationship to menstruation (Keene and Kimbrough).

**DIAGNOSIS.**—Actual diagnosis must be based upon the presence of tender, densely adherent, and firm swellings in relation with the uterine appendages, the uterus itself being commonly retroverted or the seat of fibroids. If nodules are palpable in Douglas's pouch adherent to the pelvic peritoneum in association with the above symptoms, the diagnosis is more certain. These nodules are more easily appreciated per rectum, and it is important to note that the rectal mucosa itself is normal in appearance and never adherent. This serves to *differentiate the condition from rectal carcinoma*.

**2. Recto-vaginal Endometriomata.**—These are usually associated with similar lesions in the ovaries, but sometimes occur as independent lesions. Small nodules may exist for a time without symptoms, but as the lesion progresses pain during menstruation eventually occurs, to be relieved during the intermenstrual epoch. In severe cases the rectum is encroached upon, and both the rectum and ureters may be occluded. Actual bleeding from the rectum is uncommon, but when present the possibility of a rectal malignant neoplasm is naturally suggested.

**3. Endometriomata of the Umbilicus and Laparotomy Scars** are uncommon, but their existence must be remembered when a swelling develops in this situation which becomes painful during menstruation and which may actually bleed. An implantation endometrioma in an abdominal scar is usually deeply placed, and closely simulates an incarcerated omental hernia. If superficial, a bluish discoloration may be present which, if associated with menstrual pain, will serve to distinguish the lesion from an inflammatory thickening.

**TREATMENT.**—The treatment of ovarian endometriomata is on the whole unsatisfactory in that radical measures are so frequently necessary. It must be remembered that the disease is one of comparatively young women in whom ovarian conservation is desirable. Since, however, atrophy of the endometrium and cessation of activity can only be assured by ablation of ovarian function, the proper treatment of an individual case not infrequently introduces a difficult problem. Large ovarian endometriomata, owing to the dense adhesions, usually call for excision of the affected organs, and hysterectomy may in addition be required. This was the case in 77 of Keene and Kimbrough's 109 patients who were submitted to operation. When the rectum, pelvic colon, or bladder is extensively involved, bilateral oöphorectomy is again indicated. Nothing short of the removal of all ovarian tissue will suffice. It is unnecessary, however, in such cases to proceed to excision of the diseased area itself, an operation which may be exceedingly difficult and correspondingly dangerous. Even if intestinal occlusion by the endometriomatous tumour is extreme and obstruction is threatening, it is wiser to combine a bilateral oöphorectomy with a temporary colostomy rather than to resect the bowel.

Conservative measures may be adopted in the case of the smaller ovarian endometriomata. In this group the larger ones can be excised, whilst the smaller implants are easily destroyed by cauterization.

C. D. Read and F. Roques<sup>6</sup> have reported a cure in 71·4 per cent of thirteen patients treated by conservative operation, and in 77 per cent of those in whom bilateral oöphorectomy was carried out. Smith,<sup>4</sup> on the other hand, gives 67·5 per cent of cures in his conservative operations and 100 per cent in the radical series. Keene and Kimbrough,<sup>1</sup> however, point out that although recurrence of symptoms may follow conservative measures, the lesion is of slow growth,

and the advantages of continued menstruation and the possibility of subsequent childbirth are such as to offset the relatively slight risk of recurrence. They consider that surgery is the procedure of choice, and irradiation by X rays or radium should only be resorted to on rare occasions. Recto-vaginal endometriosis unassociated with ovarian lesions can be treated by X rays, but a menopausal dose is always required. The writers do not advocate direct radium implantation, pointing out that the production of a recto-vaginal fistula is certainly not a remote possibility.

REFERENCES.—<sup>1</sup>*Jour. Amer. Med. Assoc.* 1930, Oct. 18, 1164; <sup>2</sup>*Brit. Med. Jour.* 1924, ii, 573; <sup>3</sup>*Ibid.* 1922, i, 839; <sup>4</sup>*Amer. Jour. Obst. and Gynecol.* 1929, June, 806; <sup>5</sup>*Canad. Med. Assoc. Jour.* 1928, Feb., 151; <sup>6</sup>*Proc. Roy. Soc. Med.* (Sect. Obst. and Gyn.) 1929, Sept., 1441.

**'ENDOMETRITIS' AND 'METRITIS.'** (See METROPATHIA HÆMORRHAGICA.)

**ENDOSCOPY IN LUNG DISEASE.** A. J. M. Wright, M.B., F.R.C.S.

**Suppurative Diseases of the Lung.**—Chevalier Jackson<sup>1</sup> has given some results of his unrivalled experience in the bronchoscopic diagnosis and treatment of pulmonary suppurations. He emphasizes the fact that pus in the lung can be drained through the bronchoscope without danger and without general anaesthesia. As a result of repeated bronchoscopic aspirations, there is noted an improvement in both the local and general conditions of the patient, together with a disappearance of the offensive odour owing to the diminution of the growth of saprophytic organisms. Such aspiration tends to prevent stagnation, to restore ciliary action in the bronchi, and to remove obstruction, if present, and is thus particularly indicated to prevent an acute suppurative process from becoming chronic. Bronchoscopy also allows the physician to obtain a specimen for microscopic examination which is uncontaminated by the mouth, etc., thus facilitating vaccino-therapy. He emphasizes that the bronchoscopist should only be one member of a team in the treating of pulmonary infections.

**The Mechanism of Physical Signs in some Lung Conditions.**—In a further article, Jackson<sup>2</sup> has elaborated his views as to the mechanism of production of some physical signs in the lung. Bronchial obstruction is one of the fundamental factors in the pathology of pulmonary disease, and may be produced not only by foreign bodies, but also, and more frequently, by viscid secretions, swelling of the mucosa, granulomata, and new growths. Bronchial obstruction may occur in either of three types: in the first, where the obstruction is complete (stop valve), the air in the lung is absorbed, producing atelectasis; in the second, the obstruction is incomplete, and, owing to the inspired and expired air passing through a narrowed passage, the so-called asthmatoïd wheeze may be heard near the open mouth of the patient; in the third (check valve), air can only pass in one direction, producing either collapse or emphysema. The existence of distant or absent breath-sounds, with a high resonant percussion note, justifies the diagnosis of such obstruction, which is usually due in children to a foreign body and in adults to abnormal secretions, inflammation, or new growth. The existence of absent breath-sounds with impaired percussion note suggests atelectasis, due in children probably to a foreign body and in adults to a new growth, inflammatory swelling, or abnormal secretions, etc. Bronchoscopy may reveal a quantity of secretion in the bronchi, even in the absence of moist sounds on auscultation. The majority of deaths from diphtheria are due to bronchial obstruction.

The lesson of the article would seem to be the more frequent resort to the bronchoscope in cases of pulmonary disease.

**Post-operative Lung Collapse.**—As a result of some bronchoscopic observations on cases of post-operative atelectasis, A. L. Brown<sup>3</sup> has come to the conclusion that these cases occur in two types. The first and most generally met with is that in which a bronchus is plugged by tenacious mucus. In the second group, the plugging is due to some other cause, such as a localized swelling of the mucosa. He found that in some cases the mere preparation for bronchoscopy was sufficient to dislodge the plug, while in others the bronchoscopic **Aspiration** and application of **Adrenalin** caused the lung to re-expand. He took the opportunity of observing actual effects produced on the bronchi by the inhalation of **Carbon Dioxide** given for the treatment of the collapse. He observed that it increased the rate and depth of respiration, and produced violent contractions and relaxations in the bronchial mucosa, thereby tending to free adherent discharge. It also induced a definite blanching of the lining of trachea and bronchi.

REFERENCES.—<sup>1</sup>*Jour. Laryngol. and Otol.* 1931, Feb., 73; <sup>2</sup>*Jour. Amer. Med. Assoc.* 1930, Aug. 30; <sup>3</sup>*Ibid.* 1930, July 12, 100.

**ENTROPION.** (See EYELIDS.)

**ENURESIS.** (See ALLERGY IN CHILDREN.)

**EPIDERMOPHYTOSIS.** (See SKIN, FUNGUS AFFECTIONS OF.)

### **EPILEPSY, TRAUMATIC.**

Geoffrey Jefferson, M.S., F.R.C.S.

There has always been a great deal of misconception as to what is really meant by the term 'Jacksonian epilepsy'. The error chiefly arises from the belief that 'Jacksonian' and 'traumatic' epilepsy are completely synonymous and reversible terms, which is only partly true. And thus it comes about that to many the term 'Jacksonian epilepsy' covers those innumerable patients with convulsive seizures who are able to recall an injury to the head at some period of their youth. In these cases the injuries have the habit of being of a trivial nature, yet the patient and his relatives will with a little encouragement, and often with none, firmly convince themselves that the later onset of epilepsy is definitely consequential.

Admitting our lack of knowledge of the true causes and nature of epileptic convulsions, it is but natural that one explanation should seem to be almost as good as another, and injury is as dramatic and obvious a cause as could be desired. It is, of course, conceded that certain injuries tend to produce epilepsy more often than others, and it is now known that any wound which penetrates the dura and lacerates the pia and cortex is ten times more likely to be followed by convulsions than one which does not. W. W. Wagstaffe's follow-up on his War material made this quite plain. In a series of 280 cases where there was penetration of the dura, epilepsy followed in 18.7 per cent, whilst where there was head injury without penetration, fits occurred in only 1.6 per cent. Here, then, is a definite fact that we can get hold of and shall find most useful, for in civilian practice it will be in the severer forms of localized injury, depressed fractures, that epilepsy will be most likely to arise. Further, the most fertile cases will be those in which the dura has been torn and the brain damaged by indriven bone edges. Short of actual laceration the danger will equally arise when the cortex has been pulped beneath an intact dura. For it is known that if the surface of the brain is lacerated, an adhesion will form between the dura and the cortex. This might theoretically be of no great importance, but experiment and observation have taught us that scar contraction occurs with results more widespread than

might have been anticipated. O. Foerster, of Breslau, who has worked more intensively on this subject than anyone, has been able to demonstrate this by the routine use of ventriculography or encephalography. He has shown that the pull of the scar of a cortical wound acts as deeply as the lateral ventricle, for the ventricle of the same side is always pulled towards the wound. This he terms 'ventricular wandering', a picturesque but not accurate term, as there is nothing fortuitous about the ventricular displacement; it goes towards the wound because it must. If this is the universal rule with cortical scars—and the writer's own experience agrees with Foerster's—then it would seem to be sound surgery to resect the scarred area. This would only be correct policy if we were assured that the new scar which will form will not perform the same action anew.

W. Penfield's work on cerebral scars proves that there is a marked difference between the reaction of brain tissue to incision or clean excision on the one hand and contusion and necrosis on the other. In the first class there results a fluid-filled space reminiscent of a porencephalic cavity, with very little glial proliferation in its vicinity. After a severe contusion there is extensive well-vascularized connective tissue and glial formation, and it is through the medium of this that tension is exerted on remoter and deeper parts. We conclude, therefore, that the practice of clean excision of such scars is likely to be of benefit and that the new scar will be of a benign character. Foerster and Penfield, and Penfield alone, have described a series of these operations in some of which radical improvement and even cure (a word the surgeon hesitates to use when speaking of epilepsy) has been effected. Penfield's article is beautifully illustrated and shows very well the adhesion of the dura to the injured cortex, usually over an area sufficiently limited to allow of its complete excision.

It is an axiom that surgery must not inflict a greater disability than the disease for which the operation is done. This is true of all fields of surgical venture, but in neurological surgery above all else the effects of transgression are the most apparent. The point is a most pertinent one when we come up against the problem of scars in or near the motor area. Is it justifiable to excise an appreciable portion of the motor cortex? We might be tempted to do so by recollecting two points which argue the propriety of this step: first, that losses of motor cortex in the anthropoid seem to be made reasonably good functionally, as Sherrington's experience showed; second, that several cases are on record in which a similar excision has been carried out on the human being without catastrophe—indeed, with recovery. But at the same time most of us know of instances in which damage to the Rolandic area has led to permanent crippling. The writer believes that a conservative attitude is the correct one and that excision in the motor area should be avoided except in one special circumstance. This exception is when the motor functions are already impaired. In such cases a cautious removal of the scarred area is justifiable if it is an epileptogenic focus. It is necessary that we should establish at any operation of this nature the exact limits of the motor area by stimulation. For this reason the exploration of the cortex should be carried out under local anaesthesia, which has the added advantage of allowing of 'control', the recognition of the onset during excision of some little motor weakness or the like that may serve as a caution. It is a fact that many cases of 'focal' epilepsy are produced by lesions which are not actually in the motor area itself. These may be, if not freely, completely excised after stimulation has shown us the extent of the excitable cortex. It is these cases, i.e., those where the scar is not actually in the motor area, which are likely to give results most worth the achievement.

From the foregoing remarks it is plain that the cases of epilepsy most suitable for surgical treatment are those of severe local injury, cases in which from X-ray or neurological evidence we may assume a circumscribed area of damage. Such cases will rarely be found amongst those persons referred to at the outset who have suffered those slight damages to which childhood is heir. It is only in those cases where the injury, local or general, has been severe enough to cause cortical laceration that we are entitled to assume relationship between trauma and subsequent fits. As to lapse of time before convulsions develop, it is becoming increasingly clear that all time limits are arbitrary, for fits may start upwards of three years after an injury.

Apart from these local injuries, what must our attitude be towards those epilepsies which follow a small percentage of severe general head injuries? The demonstration of a fracture line in an X-ray will not be an indication in itself, for it is more than likely that the cerebral damage is remote from that. The indication, if it comes at all, must come from two sources. First, from a most careful analysis of the 'march' of the fit and of its pattern, so that we may infer the starting or 'firing' point. Foerster's diagram of the results of his

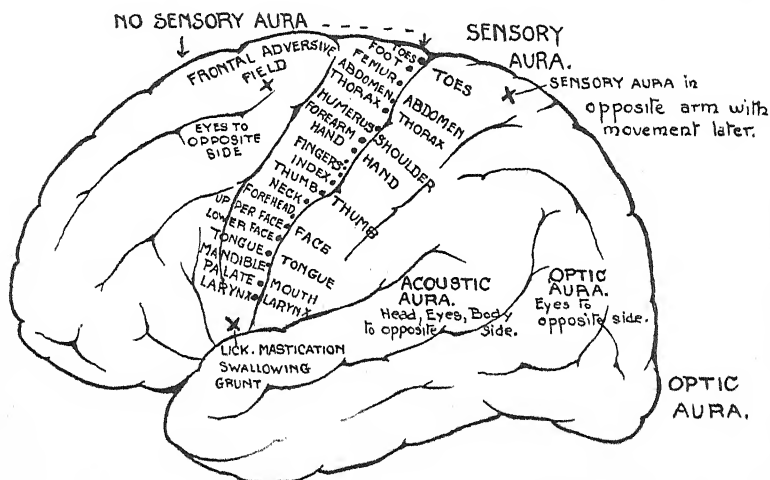


Fig. 21.—Chart of human cortex, slightly modified from Foerster's experiments.

stimulations of 100 human brains (Fig. 21) is useful here in giving us a lead as to where the fit has started. This diagram does not differ in any essential from commonly accepted physiological teaching to-day, and is a tribute in retrospect to the famous animal experimenters of bygone years. The most important clinical point is the recognition of the 'frontal adverse field', an area high in the frontal region in front of the motor cortex. Stimulation of this area results in the turning of the head, eyes, and body to the opposite side, followed by clonic movements of the contralateral arm and leg, without preceding aura. This onset is a common one in epilepsy, and excision of this area may be practised without lasting paralysis. Foerster confirms the production of contralateral sensations by stimulation of the post-central gyrus, and suggests that a limited aura means a focus in this region. Once the clinician is satisfied that he has localized the probable site of origin of the fit—and in some traumatic cases he will have visible local damage to confirm



his view—it remains for him to make and study encephalograms. By means of these he will be able to recognize the effects of brain scars by those deviations of the ventricles to which reference has already been made. It is only those cases in which the fit recurs with a constant pattern that there is likely to be an exciting focus discoverable by inspection at operation. The appropriate excision will then be carried out. The problem of cortical excision in non-traumatic epilepsies which also may have a constant form is a rather different one, but the principles governing excision are the same. In these cases it is necessary to discover by stimulation the point which 'fires' the attack, for it may not be exactly where the clinician has visualized it.

Finally, a word of explanation on the meaning of Jacksonian epilepsy. When we say that the term 'focal' epilepsy describes the same thing more vividly we have done everything but pay just tribute to the great pioneer of modern neurology. Now, a number of the early cases which most clearly supported Jackson's belief that epilepsy began in the hemisphere and not in the spinal cord were cases of local cranial trauma. But any focal lesion, traumatic, neoplastic, or inflammatory, may excite a focal epilepsy, and Jacksonian seizures are indeed more often due to brain tumours than to injury. On the other hand, many examples of epilepsy which follow injury are not focal in nature but are generalized, and we ought not to name such cases examples of Jacksonian seizures.

REFERENCES.—Foerster and Penfield, *Brain*, 1930, liii, 99; Penfield, *Ibid.* 1927, 1, 499; Penfield, *Canad. Med. Assoc. Jour.* 1930, xxiii, 189.

#### EPITUBERCULOSIS. (See TUBERCULOSIS IN CHILDREN.)

#### ERYSIPELAS. (See also SKIN, STREPTOCOCCAL INFECTIONS OF.)

J. D. Rolleston, M.D., F.R.C.P.

TREATMENT.—As the result of the study of 235 acute cases of erysipelas treated by Vaccines and an equal number treated by symptomatic measures only, T. Benson<sup>1</sup> comes to the conclusion that the administration of stock or autogenous streptococcal vaccines or mixed streptococcal and staphylococcal vaccines in erysipelas does not: (1) shorten the duration of the attack, (2) prevent the extensive spread of the inflammatory process, (3) lessen the incidence of complications such as abscesses or cellulitis, (4) diminish the occurrence of relapses, (5) prevent recurrence, or (6) diminish the mortality of the disease.

R. H. Jameson and F. Hernaman-Johnson<sup>2</sup> record two cases of facial erysipelas in adults treated by X Rays, in which the temperature fell immediately after the first application of small doses.

REFERENCES.—<sup>1</sup>*Lancet*, 1930, ii, 1286; <sup>2</sup>*Brit. Med. Jour.* 1931, i, 57.

Sir W. I. de C. Wheeler, F.R.C.S.I.

R. C. Eley<sup>1</sup> calls attention to the extremely high death-rate from erysipelas in infants, particularly those under one year of age, and the unsatisfactory results of various methods of treatment. He states that experiments made on animals and in clinical cases since 1925 have shown that specific Antitoxin is of great value in the control of the infection. He noted no untoward effects in the cases of infants when he gave an initial dose of 10 c.c. of a concentrated serum intramuscularly and repeated it daily until the lesions disappeared. In more severe cases no ill effects were noted when the same initial dose was given intravenously. Eley stresses the importance of the early administration of the serum treatment. Its most noteworthy effects in the cases reviewed were disappearance of the toxicity and improvement in the general condition, which often were apparent before any material change was observed in the lesions.

REFERENCE.—<sup>1</sup>*Amer. Jour. Dis. Child.* 1930, xxxix, 529.

**ERYSIPELOID (Swine Erysipelas).***A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.*

Erysipeloid of Rosenbach is a well-known, though uncommon, condition in this country and has been shown to be due to infection of the skin with the bacillus of swine erysipelas. It is usually seen on the hands, and consists of a slowly spreading salmon-red infiltration beginning at the site of an injury, usually a scratch from the bone of an animal among butchers, or from the bone or shell of a fish among fishermen and fishmongers.

J. V. Klauder and M. J. Harkins<sup>1</sup> have studied the disease among the commercial fishermen on the New Jersey sea coast and among the workers in abattoirs in Chicago and elsewhere. They find that the infection is more frequently obtained from contact with fish and crustacea and from sources other than contact with the flesh of swine. The disease appears to be widespread among commercial fishermen along the entire Atlantic sea-coast and is an important disease of the fishing industry. The skin eruption is apt to be complicated by lymphangitis and glandular enlargement and sometimes by mild constitutional symptoms, but no arthritic symptoms were observed and no acute fatal cases seen. The infection appears to be much less common and also milder among handlers of fish shipped to the market. They attribute this to less intimate contact, to the fact that the fish have been cleansed, washed, and packed in ice, and to a change in virulence through changed environment. The infection is rare among veterinarians, and is not common in the meat-packing industry.

**TREATMENT.**—As to treatment, the writers point out that cases usually run a course of about three weeks, but recurrences are not uncommon, and cases may then run on for several months. They consider the only effective local treatment to be **Rest** and **Heat** in the form of wet packs. They have specially directed their attention to the use of a **Serum** of swine erysipelas in shortening the course of the disease. The results are not very certain, but have been good with multiple subcutaneous injections around the affected area. The investigations are being continued.

REFERENCE.—<sup>1</sup>*Jour. Amer. Med. Assoc.* 1931, April 11, 1205.

**ERYTHEMA INFECTIONOSUM.***J. D. Rolleston, M.D., F.R.C.P.*

**EPIDEMIOLOGY.**—A. L. Lawton and R. E. Smith<sup>1</sup> record an epidemic of 97 cases which occurred in Branford, Connecticut, between November 1, 1929, and February, 1930; 54 were females and 43 males. The ages ranged from 8 months to 45 years, but the great majority (88) were between 4 and 12 years of age. Of 68 families in the series with 2 or more children, 17 had more than one case. In one family with 6 children all were affected. Eighty-five cases occurred in school children; in one school there were 45 cases. Inoculation of rabbits was entirely negative.

A. Pinelli<sup>2</sup> describes an epidemic which occurred at Catazzaro during the period April to June, 1930. Children between the ages of 3 and 8 years were chiefly affected, and there were no instances of infants being infected by their mothers or other members of the family. The blood was always sterile and showed a lymphocytosis in all stages of the disease. All recovered.

REFERENCES.—<sup>1</sup>*Arch. of Internal Med.* 1931, xlvii, 28; <sup>2</sup>*Pediatrics*, 1931, 248.

**ERYTHREMIA (Polycythæmia Vera; Vaquez-Osler Disease).***Stanley Davidson, M.D., F.R.C.P.E.*

**Polycythæmia Vera and Chronic Pulmonary Disease.**—Four cases of polycythæmia with chronic pulmonary disease are reported by N. W. Barker,<sup>1</sup> and the question is discussed whether the cases are genuine examples of

polycythæmia vera or secondary to chronic pulmonary disease. The author concludes that since the blood volume, estimated by the vital-red dye method of Keith, Rowntree, and Gerhartz, a point on which they lay great importance in diagnosis, was high, and the response to treatment by destruction of blood with phenyl hydrazine was good, these cases were best considered as genuine ones of polycythæmia vera, associated with complicating pulmonary disease. Treatment was carried out by the oral administration of **Phenyl-hydrazine-hydrochloride** in doses of 0.1 grm. three times a day. The total given at a course varied from 1 to 2.8 grm., and a period of two weeks' rest was given between courses. The drug is highly potent and dangerous, and the results of treatment must be most carefully checked by white- and red-cell counts. The relief of respiratory symptoms, as well as those solely due to the polycythæmia, was definite in all cases treated. This method for the destruction of blood was first described by Eppinger and Kloss in 1912, and again in 1918, in Germany, and has since been used by workers in many parts of the world. In the opinion of the author, it is the most satisfactory form of treatment for patients aged less than 60 years in whom the condition is not too far advanced, and who can be treated as ambulatory patients.

**Radiation Therapy of Polycythæmia Vera.**—G. T. Pack and L. F. Craver<sup>2</sup> conclude that erythremia with splenomegaly can be profitably treated palliatively by irradiation. Treatment should be directed towards the bone-marrow rather than the spleen, since the hyperplastic bone-marrow is the cause of this disease, and is radio-sensitive. Cycles of treatment in which the spine, sternum, and the long bones are irradiated at intervals of months, are controlled by the clinical and hæmatological conditions of the patient. The symptoms of plethora are relieved, general health is improved, and life is prolonged by the use of Roentgen rays or radium, but these measures are not capable of preventing the usual fatal termination of the disease.

REFERENCES.—<sup>1</sup>*Arch. of Internal Med.* 1931, Jan., 94; <sup>2</sup>*Amer. Jour. Med. Sci.* 1930, Nov., 609.

**ERYTHREDEMA.** (See PINK DISEASE.)

**EXOPHTHALMIC GOITRE.** (See GOITRE; HYPERTHYROIDISM.)

**EYE AFFECTIONS.** (See CORNEA, DISEASES OF; EYE, FOREIGN BODIES IN; NYSTAGMUS; OPTIC ATROPHY; RETINA, DETACHMENT OF; SQUINT; VISUAL TESTS FOR MOTOR DRIVING.)

**EYE, FOREIGN BODIES IN.** *W. S. Duke-Elder, M.D., F.R.C.S.*

The presence, or the possible presence, of an intra-ocular foreign body is always a matter of concern to the practitioner, not only because of the damage which may result to the vision of the affected eye, but also because of the danger of sympathetic disturbance to the other. The effect, both upon the wounded eye and upon its fellow, varies considerably with the type of foreign body involved. If it is large, so much damage is usually caused that no anxiety arises; the diagnosis is obvious and immediate removal of the eye is the only possible treatment. If, however, the foreign body is small and has created little immediate disturbance, the diagnosis and the treatment may present considerable difficulties.

**DIAGNOSIS.**—This depends first upon seeing the wound of entry and following the track of the foreign body in its course through the eye. Unfortunately, this is frequently not so simple or obvious a matter as it might appear to be. It must be remembered that a very large proportion of foreign bodies are very

minute particles travelling at a high velocity, such as chips of steel or stone, particles of glass, and so on, and these may enter the eye without causing any marked pain; the patient may notice a sudden stinging sensation, but since nothing further immediately develops, he takes no more cognizance of it. The wound of entrance may be very small, and if in the cornea may be readily overlooked, while if in the sclera it may be even more difficult to locate. It is therefore of extreme importance that a very diligent search be made for small corneal or scleral wounds, and for such evidences of penetration as are afforded by a hole in the iris or a track through the lens. In such an examination a slit-lamp is almost a necessity if a decision has to be made whether a corneal scar is a recent perforating wound or merely a deep cut into the corneal substance.

The second step in diagnosis is the location of the foreign body inside the eye. It is only rarely that it can be seen, and its presence thus established, for the velocity necessary to penetrate the thick cornea-sclera is usually sufficient to carry the particle behind the diaphragm formed by the lens and iris. Having traversed the lens, it frequently renders this structure opaque, or brings about a hæmorrhage into the vitreous body, so that the occasions when a particle is visible upon the fundus are few. In the majority of cases, therefore, reliance for a diagnosis of an intra-ocular foreign body rests with skiagraphy. This method, of course, has its limitations, for relatively few substances are opaque to X rays; but it fortunately happens that the vast majority of foreign bodies in the eye which are so small that doubt remains about their presence, are metallic.

In the employment of this method, however, extreme accuracy is essential, for a localization to within 1 mm. may be absolutely necessary if it is to be definitely established that a foreign body lies within the eye or in the orbit. Various methods of localization are in use. That introduced by Mackenzie Davidson is usually employed in this country, the principle of which is as follows. A piece of lead wire is affixed to the patient's eyelid, while the side of the head with the injured eye is fixed flatly against two cross-wires stretched across a space in a board admitting a photographic plate. Two skiagrams are taken from two points of view with the patient looking so that the visual axis of the injured eye is parallel to the horizontal cross-wire; and on the negative are seen the images of the two cross wires, the lead wire, and the foreign body. From the pictures thus obtained the exact position of the foreign body can be found by a specially designed localizer. This consists essentially of a cross-thread suspended from a sliding scale situated at a distance from a horizontal glass plate equal to that between the anode of the X-ray tube and the film when the picture was taken. Upon the plate are cut two lines at right angles corresponding to the two cross-wires shown on the negative. The negative is now placed upon the plate so that the image of the cross-wires lies over the cut lines, and the threads suspended from the scale are separated by a distance equal to that which separated the positions of the tube during the two exposures. Then since X rays are not bent when passing through a body, it is possible to represent the paths of the rays by the threads stretched from the scale to the image of the foreign body on the negative.

A second method introduced by Sweet is more commonly used in America. The most recent modification depends on the fact that the tube, an indicating rod situated a known distance from the apex of the cornea, and the plate-holder are on a movable stage so that they preserve a known relation to each other which does not vary. The instrument is adjusted telescopically so that the indicating rod is exactly in the correct relation to the cornea, and two photographs are taken from two points, one so that the rays pass in a direction

corresponding with the horizontal plane of the eyeball, and the other with the tube at its farthest point to the right or left of the first position, depending on which eye is to be examined. Since the relative position of the tube with reference to the indicating rod and the photographic plate is fixed and known, the X rays in passing through the eyeball follow a definite course which is always the same for the two separate exposures; they can, therefore, be precisely indicated on a localization chart, and the situation of any opacity is thus determined. This method has been simplified technically by Sweet, and more recently by Goalwin.<sup>1</sup>

By the bone-free method of Vogt extremely small or non-metallic foreign bodies can frequently be demonstrated. This has a limited but indispensable application, being suitable only for the anterior segment of the eye. The conjunctiva is anesthetized and a small film of special shape is introduced into the sac nasal to the globe. The X-ray tube is then centred perpendicularly to the film, and five pictures are taken with the tube and each film in the same position, but with the visual axis directed successively straight forward, nasally, temporally, upwards, and downwards. A similar set of five films is then taken with the film below the eyeball and the tube above. Since only soft tissues interpose between the tube and the film, semi-transparent bodies are easily seen; and from the relative position of the shadow in the ten films the position of the body can be calculated.

In the classical method of localizing a foreign body on charts corresponding to the three main views of the eyeball parallel to the three co-ordinate planes, it is possible for it to appear within the outline of the eyeball in all three views and yet be extra-ocular. This occurs, for example, if it is situated on a radius equally inclined to all three principal axes. To overcome this difficulty Goalwin has recently introduced a simple method whereby the localization can be transferred from the usual chart to a meridional chart denoting the meridional section which contains the foreign body. Not only does such a chart indicate at once whether the body is intra-ocular or extra-ocular, but also the particular structure of the eyeball it is in (if intra-ocular). In addition his charts are more accurate, being based on the more precise measurements of the schematic eye of Gullstrand instead of the traditional schematic eye of Helmholtz. If these charts are not available, he has deduced from the measurement of Gullstrand a 'square-root rule' to indicate if the foreign body is intra-ocular. If its radiographically determined distances from the principal vertical, horizontal, and equatorial sections are respectively  $a$ ,  $b$ , and  $c$ , then its distance from the centre of the eyeball is  $\sqrt{a^2 + b^2 + c^2}$ .

In an emmetropic eye, if the result is less than 12.4 mm., the foreign body is intra-ocular; if more than 12.4 mm. it is extra-ocular; and if between 11.4 and 12.4 mm., it is in the ocular wall. He has also deduced from the calculations of von Rohr a simple rule for rapidly estimating the axial length of an axially ametropic eye of known refractive power: the emmetropic eye is 24.4 mm. long; subtract 0.33 mm. for each dioptr of hypermetropia up to 10 dioptries, 0.5 mm. for each of the first 10 dioptries of myopia, 0.6 for each of the next 6, and 0.75 for each of the next 4; add 1.25 mm. for the thickness of the ocular wall at the posterior pole.

In border-line cases where there still remains doubt whether the body is intra- or extra-ocular, much information can be obtained from the direction in which it is lying, provided it has one long dimension. In this case the two ends of the body are localized separately so that the direction is determined accurately: then, if it is parallel to the ocular wall it is on the retina; if it is perpendicular to the ocular wall, it is in the wall; and if it is neither parallel nor perpendicular it is probably extra-ocular, since the to-and-fro movements

of the retrobulbar tissue usually bring it into an inclined position. If the foreign body is globular, films are taken before and after the eye has moved throughout a definite angle, and the precise relative position of the foreign body with regard to the indicator is studied.

If all these methods of investigation fail, a diagnosis may be made, if the body is magnetizable, by a sharp sensation of pain when the eye is brought into the field of a powerful magnet, owing to the traction of the foreign body on the ocular tissue in which it is embedded; but if this method of investigation also fails, an opinion can only be based upon the subsequent reaction which occurs in the eye.

The reaction which a foreign body excites in the eye depends on two factors—infection and chemical changes. If a small foreign body is to perforate the globe, it must usually travel with a velocity so high as to render itself sterile by friction in its rapid transit through the air. This applies especially to metallic particles, and least of all to fragments of stone. It is to be remembered that the lens and vitreous body form excellent culture media, so that even saprophytic organisms are prone to set up suppuration in the eye. In the event of commencing signs of infection, a most careful watch should be kept for the formation of gas bubbles in the aqueous humour, an early indication of infection by organisms of gas gangrene, which can only be treated by immediate evisceration of the globe.

Chemical changes become evident more slowly. Iron gives the typical reaction of siderosis, which is usually inaugurated by the deposition of a rusty deposit on the subcapsular epithelium of the lens. This is followed by a greenish-brown staining of the iris, while vision gradually fails owing to degenerative changes in the lens and retina. Copper gives a much more acute reaction, frequently causing violent suppuration in the absence of pyogenic organisms. Other metals produce less marked chemical changes; but wood, apart from infection, is noteworthy from the intense local irritation produced, resulting in the formation of dense granulation tissue. If the foreign body has traversed the lens, a traumatic cataract develops; if it lies in the vitreous body, this liquefies and degenerates; and in most cases if it is retained for any length of time, pigmentary degeneration of the retina occurs, frequently affecting the macular region preferentially. This involves a gradual deterioration of vision which is not recovered from.

Not least among the dangers of an intra-ocular foreign body is the possibility of the development of sympathetic ophthalmia, a danger which must always exercise a considerable influence on the treatment to be adopted. The earliest evidences of serous or plastic iridocyclitis in the other eye must therefore be carefully watched, and apart from the gross clinical signs of keratic precipitates, two methods of investigation are of great value. In the first place the extreme value of the slit-lamp cannot be over-estimated. The essential diagnostic point in an early case is the presence in the vitreous, the aqueous, and the retrolental space of free floating particles ('cells'), often in large quantity, which ultimately are precipitated on the back of the cornea as pellucid and granular keratic precipitates, and as small transient patches of exudate on the pupillary margin, and sometimes on the iris itself. A second sign of importance is derived from a blood-count, which in a case of early sympathetic disease frequently shows a considerable excess of large mononuclear lymphocytes, with a concomitant decrease in polymorphonuclear leucocytes.

**TREATMENT.**—As a general rule a foreign body in the eye should be removed if possible. To this there are rare exceptions: if it is sterile and of a nature which will not excite a chemical reaction, if little damage has been done to vision, and if its removal will almost inevitably lead to the destruction of

vision. If the foreign body is magnetizable it can usually be removed by a magnet: it should be drawn into the anterior chamber, if necessary, and then withdrawn through a keratome incision. As a rule this route of removal gives better results than removal posteriorly through the sclera even in the presence of an entrance wound in this tissue. If the foreign body is non-magnetic, the difficulties in its removal are much greater. If it is in the anterior chamber, it may be removed by iris forceps; if it is entangled in the iris, an iridectomy may be necessary; and if it is embedded in the lens, a curette evacuation after a few days is usually the most successful expedient. But if it lies behind the lens (and is non-magnetic), removal is practically impossible, and treatment lies between leaving it alone and watching the case, or excising the eye on account of the damage done or the danger of sympathetic disturbance.

**PROGNOSIS.**—The prognosis should always be guarded, and is frequently bad, especially if the foreign body is in the posterior segment of the eye. Even although it is successfully removed by the magnet, and the immediate result seems good, irreparable damage is often done to the eye, for the vitreous body frequently fills with fibrous tissue bands and retinal detachment follows, or a serous iridocyclitis may be set up and the eye shrinks.

REFERENCE.—<sup>1</sup>*Arch. of Ophthalmol.* 1931, vi, 221.

### EYELIDS: BLEPHAROSPASM AND SPASTIC ENTROPION.

*W. S. Duke-Elder, M.D., F.R.C.S.*

A considerable interest has been taken during the past year or two in the method introduced by Weekers, of Liège, in 1928 of treating spasmodic contraction of the eyelids and those forms of entropion which do not come under the category of cicatricial with a local **Injection of Alcohol**. Weekers recommended that, after anaesthetization with 2 per cent novocain, 1 c.c. or slightly less of 80 per cent alcohol be injected subcutaneously along the lower lid. Great care should be taken to make the injection sufficiently deep so as to avoid the skin in case of necrosis, and the nasal quarter of the eyelid should always be left free so as to avoid interference with the lacrimal canaliculus. If a greater effect is desired it can be attained by adding two parts of **Iodine** per 1000 to the 80 per cent alcohol. In the past several alternative methods have been suggested in the treatment of this type of entropion, such as by a rubber attachment to the spectacle frame which everts the lid, pulling down the lid by a piece of plaster, and operative methods, among which the more usual have been an excision of part of the skin and the underlying orbicularis muscle, or a shortening of the lower lid. Terson and Safer have reported on a series of cases in which they have tried the new method of alcohol injection with good results. The important part of the technique is that the injection should be made subcutaneously into the substance of the orbicularis muscle, and although œdema of the lids lasts for a few days, the results claimed are satisfactory.

### FALLOPIAN TUBES AND OVARY, HERNIA OF. (*See* HERNIA OF THE OVARY.)

#### FILARIASIS.

*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

**SEROLOGICAL AND INTRADERMAL TESTS.**—N. H. Fairley<sup>1</sup> has made an important advance by working out a new complement-fixation reaction for the diagnosis of filarial disease on similar lines to his earlier test for schistosomiasis. He used as his antigen a water-soluble extract of dried *Dirofilaria immitis* of dogs sent to him by Dr. le Suer from Borneo. The technical details of the test, on the lines of the Wassermann test advocated by the Medical

Research Council, are fully described, and the results of 70 patients sera-tested by it are dealt with: 59 gave negative reactions, and 55 of these gave no evidence of filarial infestation, while 3 were old cases of *F. bancrofti* in which the embryos could no longer be found, and they gave strongly positive intradermal tests for filariasis with the same antigen as previously used in 1930 by Taliaferro and Hoffman—a test which the present writer has confirmed. These findings support the view that the intradermal reactions are anaphylactic in nature. On the other hand, positive complement-fixation reactions were obtained in 11 patients showing actual filarial infections, including 6 with *L. loa* and 4 with *F. bancrofti*, and the value of the test is enhanced by the fixation being obtained with antigen dilutions of from 1-100 to 1-800. The intradermal test with the same antigen produced typical wheals either with pseudopods or with a diameter of at least 1 cm., but not in controls, within thirty minutes of injecting 0.25 c.c. of a 1 per cent solution of dried antigen, and this test was positive in cases of *L. loa* and *Onchocerca volvulus* in addition to *F. bancrofti* infections. Fairley suggests that Calabar swellings are local anaphylactic reactions involving the cells of the subcutaneous layer. Further work on these lines will be awaited with interest.

EPIDEMIOLOGY.—A. C. Chandler, G. Milliken, and V. T. Schuhardt<sup>2</sup> record a case in which the release of some of the body fluids of a *Loa* worm under the conjunctiva at the time of its extraction led to the appearance of three Calabar swellings in distant parts of the patient's body, which, taken with the production of a typical Calabar swelling by the injection of a filarial antigen, supports very strongly Fulleborn's suggestion of the allergic nature of these swellings.

In Northern Nigeria A. W. Taylor<sup>3</sup> found 8 per cent of *A. funestus* and 4 per cent of *A. costalis* to be infected with filarial embryos in both the European and the African parts of the station of Gadau. In further papers V. T. Korke<sup>4</sup> records that in the Bihar and Orissa province of India *F. bancrofti* was most prevalent in the coastal area, next in the plain of the Ganges, and least in the submontane areas, and only *C. fatigans* was found to be infected, especially in June and July. Rice crops, urban populations, and the presence of *C. fatigans* favoured high incidence. The infections are also favoured by insanitary cement drains, in which water is allowed to accumulate, and areas watered by reservoirs or artificial tanks in which *C. fatigans* breed at all seasons.

S. Sundar Rao<sup>5</sup> describes, under the name of *Microfilaria actoni*, a small sheathless microfilaria he found in large numbers in the blood of a Bengal patient, and he considers it to be closely allied to *A. persans*, which has only once been found in Asia, by Ho in Korea in 1929.

*Microfilaria malayi* is further described and illustrated by its discoverer, S. L. Brug.<sup>6</sup> The principal points which serve to distinguish it from *Microfilaria bancrofti*, as shown in Fig. 22, are: (1) The nuclei are "more clotted together and difficult to count; (2) The anal pore is easily distinguished as an oval unstained spot about one-fifth of the total length from the posterior end; (3) The tail shows one to three nuclei instead of being quite devoid of them." The geographical distribution in the Malay Archipelago as far as it is yet known is shown in Fig. 23. According to Lichtenstein, *F. malayi* does not develop in *C. fatigans*, but it does so in *Taniarhynchus* (*Mansonioides*) *annulatus* and *annulipes*, which were found to be by far the most common man-biting mosquitoes in the affected areas, and the development of the filaria was traced to the proboscis of these insects. Elephantiasis is also common in areas where only the *F. malayi* was found, so it is the probable cause of the condition.

CLINICAL.—The diagnosis of lymphatic obstruction due to filariasis from conditions it is liable to be confused with by the inexperienced is described and illustrated in a paper by H. W. Acton and S. Sundar Rao.<sup>7</sup> They include



diffuse fibroneuroma, fibromatosis, fibrolipoma, hypopituitarism, macrogynmastia, giant urticaria, and elephantiasis nostra. Emphasis is laid on the value of careful study of the disease in the endemic areas as opposed to flying cold-weather visits, and on a combination of mean wet-bulb temperature

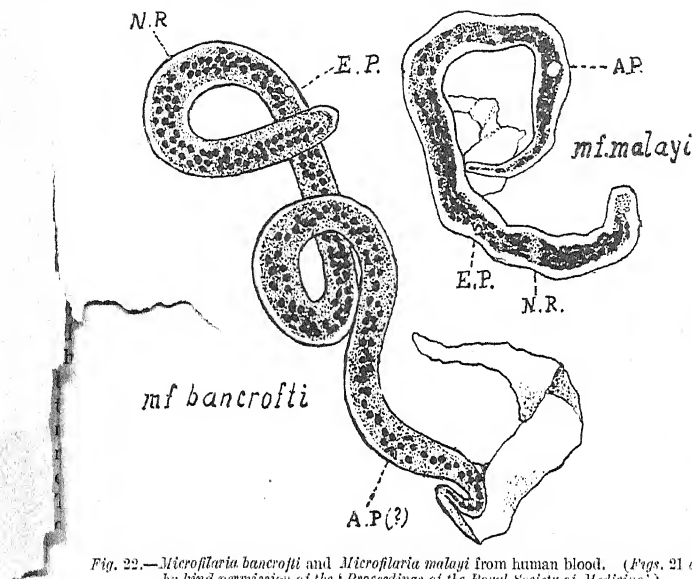


Fig. 22.—*Microfilaria bancrofti* and *Microfilaria malayi* from human blood. (Figs. 21 and 22 by kind permission of the 'Proceedings of the Royal Society of Medicine'.)

readings with little diurnal variation from 80° to 82° F. for much of the year, *Culex* breeding places, and a dense population, as the factors present in endemic areas producing repeated infections over a long period; a map of India shows

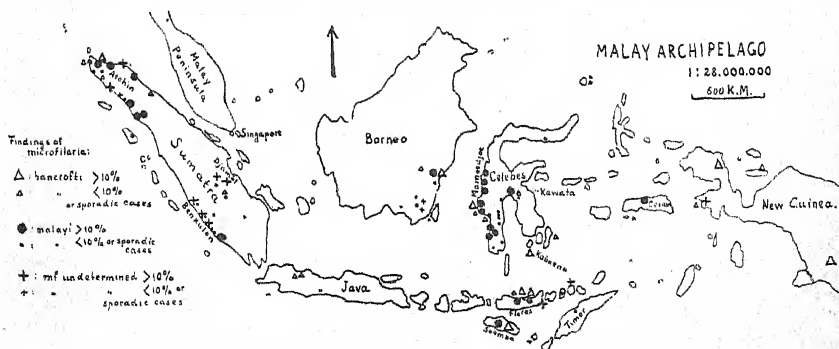


Fig. 23.—Findings of microfilaria in the Malay Archipelago.

the damp low-lying coasts to be mainly affected. The same workers<sup>8</sup> deal with the causation of lymph-scrotum, and they record that each of the nine cases studied gave a history of previous radical operation for hydrocele, which they think predisposed to lymph-scrotum by inducing artificial trauma in

patients infected with *F. bancrofti*. In a third lengthy paper<sup>9</sup> the same investigators discuss the factors determining the different types of lesions produced by *F. bancrofti* in India, based on inquiries in six large towns in different parts of India made by the second-named worker. They regard as endemic areas those in which the microfilaria-rate is over 10 to 20 per cent, and as hyperendemic those with higher rates. They give the age when lesions commonly commence as 8 to 10 years in hyperendemic and 14 to 16 in endemic areas, but 20 to 30 years in places with low endemicity; and signs of lymphatic obstruction generally begin with the disappearance of microfilaria from the blood, except in chyluria. In hyperendemic areas the first lesions are seen in the epitrochlear or inguinal glands, followed by filarial abscesses and later by elephantoid changes.

REFERENCES.—<sup>1</sup>*Trans. Roy. Soc. Trop. Med. and Hyg.* 1931, April 25, 635; <sup>2</sup>*Amer. Jour. Trop. Med.* 1930, Sept., 345; <sup>3</sup>*Ann. Trop. Med. and Parasitol.* 1930, Oct. 22, 425; <sup>4</sup>*Ind. Jour. Med. Research*, 1930, July, 319 and 333; <sup>5</sup>*Ibid.* 1931, Jan., 979; <sup>6</sup>*Proc. Roy. Soc. Med.* 1931, April, 663; <sup>7</sup>*Ind. Med. Gaz.* 1931, Jan., 11; <sup>8</sup>*Ibid.* 1930, Oct., 541; <sup>9</sup>*Ibid.* Nov., 620.

### FINGERS, INJURIES OF. (See also HAND AND ARM, INFECTIONS OF.)

Sir W. I. de C. Wheeler, F.R.C.S.I.

The necessity for conservative treatment in dealing with lesions of the hand, whether traumatic or infective, needs emphasis. Slight loss of function may be a serious matter, especially if the thumb is involved.

M. L. Mason and S. L. Kock<sup>1</sup> deal with *human-bite infections* of the hand. They state that bite infections are frequently prolonged in their course and difficult to clear up because the infection is usually introduced deeply into the tissues through a comparatively small wound. There is a relatively low resistance of fascia, tendon, and bone to a mixed infection such as is caused by the

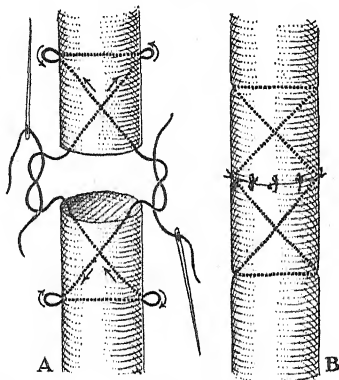


Fig. 24.—Technique of tendon suture.

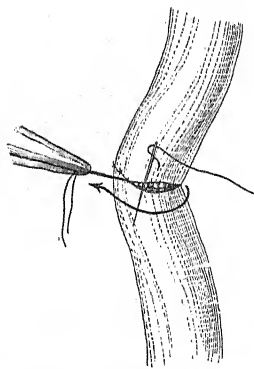


Fig. 25.—Technique of nerve suture.

(Figs. 24-26 by kind permission of 'Surgery, Gynecology and Obstetrics'.)

organisms present in the mouth. Unless such wounds are drained early and adequately, bone, joint, and tendon involvement are certain to occur and to lead to extensive impairment of function.

W. Bates<sup>2</sup> deals with the same subject. He discusses not only human bites, but also wounds in the region of the knuckles caused by blows against the teeth in fighting. A wound caused by a tooth is infected immediately with many organisms of varying degrees of virulence. In the absence of rabies,

infection of the wound is not to be expected in dog-bites. A dog-bite may be mutilating, but only rarely does it cause infection. A horse-bite is more of a pinch than a bite and seldom breaks the skin. A cat-bite produces a wound that soon shows severe infection. If the skin is broken by either a horse or a cat-bite, tetanus antitoxin should be administered. This writer recommends the treatment of bites with the **Electric Cautery**. The patient is given a gas anaesthesia. In the penetrating-bite cases the whole tooth-mark is removed with the cautery. The patient awakes with a pain-free wound. In the evulsive and amputating bites, the entire raw surface is seared with the cautery. The best time to apply this treatment is immediately after the wound is produced.

S. L. Kock<sup>3</sup> deals with the immediate treatment of injuries of the hand. He states that it is well-nigh impossible to divide the flexor tendons of the fingers near the wrist without dividing the median nerve and without injuring the ulnar nerve, and it must not be forgotten that an individual with the long flexor tendons intact can close the fingers and thumb even if both median and ulnar nerves are divided at the wrist, for the nerve-supply of the long flexor muscles enters the muscles high in the forearm. The lesson to be learned is the obvious one, that the hand should be tested for sensation as well as for movements after recent lacerations on the flexor aspect of the wrist. Kock also points out that when there are fractures of the phalanges with exposure and laceration of the tendons and with a considerable loss of skin, conservative surgery should at first be tried. After débridement, the skin may be drawn together by sutures here and there and a free full-thickness graft of skin from the thigh sutured over any raw surface. Figs. 24 and 25 show the methods of tendon and nerve suture respectively. When the tip of the finger has been lost and the case is seen within a few hours, a free full-thickness skin-graft from the arm or thigh sometimes gives a satisfactory result (Fig. 26). Pressure should be applied on the graft during the first few days. This can be easily accomplished by strips of elastoplast carried over the top of the finger.

REFERENCES.—<sup>1</sup>*Surg. Gynecol. and Obst.* 1930, Nov., 591; <sup>2</sup>*Ann. of Surg.* 1931, March, 641; <sup>3</sup>*Surg. Gynecol. and Obst.* 1931, Feb., 594.

**FISSURE, ANAL.** (See ANUS, FISSURE OF.)

**FISTULA, ANAL.** (See ANUS, FISTULA OF.)

## FOOD AND THE PUBLIC HEALTH.

G. E. Oates, M.D., M.R.C.P., D.P.H.

**Iodine in Nutrition.**—J. B. Orr<sup>1</sup> reports the results of a survey undertaken to determine whether any striking difference between the iodine content of public water-supplies and locally grown foodstuffs occurred in goitre and

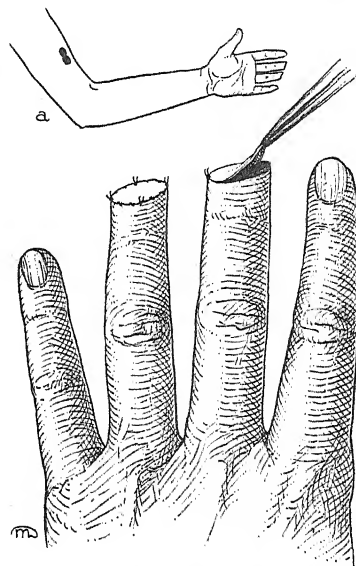


Fig. 26.—Technique of application of a free full-thickness graft to the tip of a finger.

non-goitre districts. Analysis of the drinking-water from the supplies of eleven towns and eight rural areas showed no correlation between the concentration of iodine in the water and the incidence of goitre in the area from which it came. A similar result was obtained by R. A. Shore and R. L. Andrew<sup>2</sup> in a carefully conducted investigation of the conditions in the North Island of New Zealand, where in some districts goitre is endemic. Orr found indications that the iodine supply, as judged from analyses of milk, eggs, and cabbage, was higher in the Scottish area, which is known to be goitre-free, than in the English counties where goitre is endemic. He did not find any definite difference between those areas in England which were reported to have a low goitre incidence and those reported to have a high goitre incidence. Shore and Andrew found a fairly close inverse relationship between the incidence of goitre and the amount of iodine in the soil. It is only within the last few years that the chemical methods in use have been sufficiently accurate to enable iodine determinations to be made in substances where it occurs in very small quantities. Even now further progress in this branch of research is impeded by the difficulty of estimating traces of iodine in the presence of organic matter.

J. B. Orr and I. Leitch<sup>3</sup> have made an exhaustive survey of all existing information as to the influence of iodine on the bodily functions. Iodine is widespread in its occurrence, but notably lacking in certain localities. Water from formations rich in lime and magnesium contains relatively little iodine, and rivers fed by glaciers are also low in iodine content, especially during the melting of the snows. Nearly all the iodine present in sea-water has been lost in the formation of natural deposits of salt, and both crude rock salt and refined salt are poor in iodine content. Small amounts of iodine in the diet are essential for the proper growth and metabolism of man. Deficiency in iodine causes goitre. The thyroid gland normally contains iodine, and the amount is less in goitrous glands. The thyroid gland secretes internally an organic iodine-containing substance, thyroxin, which can be synthesized by chemists. The minimum amount of iodine required by an adult male is probably about 45-millionths of a gramme, and by a child about 150-millionths. A salt containing 1 gm. of potassium iodide in 100 kilos. of natural salt was found eminently successful by the Swiss in the treatment of slight goitre in school children, in the prevention of goitre in children, and, most important of all, in the prevention of congenital goitre. Since its introduction in 1922, no children with congenital goitre have been born from women using iodized salt for at least five months of pregnancy.

In the vast majority of cases the administration of iodine arrests the growth and reduces the size of goitrous glands. The effect is greater the earlier the treatment is applied. After the age of puberty the efficacy of treatment is reduced, and after 20 is practically confined to soft parenchymatous goitres, hard and nodular goitres giving little or no response. C. Wegelin<sup>4</sup> is convinced that a second factor, apart from iodine deficiency, is necessary for the development of endemic goitre. (*See also* HYPERTHYROIDISM.)

**The Value of Apples in the Diet.**—Apples are of distinct value in the diet, although they contain little nutriment. They supply ballast to the intestines. They are a valuable source of mineral salts. They serve to cleanse the teeth, and are a source of vitamins B and C. S. S. Zilva, F. Kidd, and C. West<sup>5</sup> state that the antiscorbutic vitamin present in fresh apple is not equally distributed in the fruit. It is at least six times as concentrated in the peel as in the region of the core. It would appear that the best way to consume a raw apple is to cleanse its outside and to eat it unpeeled. Apples if cooked in their skins are found to retain almost all their antiscorbutic

activity. The storing of apples in the frozen state does not appear to affect the vitamin content, but gas storage as applied to imported apples has a deteriorating effect on antiscorbutic activity. On these grounds it would appear that home-grown apples are preferable to imported ones.

**Aluminium Vessels for Cooking.**—The German Federal Bureau of Health recently instituted an inquiry<sup>6</sup> as to whether the use of aluminium vessels for cooking could be injurious to health. After many experiments on animals, extending over months, and also observations on man with comparatively large doses of aluminium (much larger than would be taken up from cooking vessels), no kind of disturbance could be noted, and it was found that the metal found in the ingested metal compound does not enter the body fluids from the intestine, but is carried off through the gastro-intestinal tract. Neither in the blood, the urine, nor the organs and tissues of the dogs allowed to ingest significant doses of aluminium, during a year's experimentation, could more aluminium than usual be found. No injury to health or disturbance to well-being could be observed in man. K. Mackenzie by experiments on pigs<sup>7</sup> and on rats<sup>8</sup> has proved that the absorption of aluminium from normal diets containing moderate amounts of available aluminium is small, that aluminium is not accumulated in the body, and that aluminium excretion is confined to the alimentary canal. No harmful effect on general growth and metabolism resulted from administering comparatively large amounts of aluminium.

**Lead Poisoning from Drinking-water.**—N. Lorraine<sup>9</sup> reports a case of severe chronic lead poisoning due to drinking-water which had taken up lead in large amount from the lead pipe system. The symptoms extended over a period of two years and included anaemia, constipation, colic, loss of weight, wrist-drop, amenorrhœa, and a miscarriage. Finally lead was found in the urine and the condition diagnosed. The water-supply of the patient's house was from a shallow well, the water being exceedingly hard, and acid from surface contamination. It readily took up lead in solution in dangerous amounts from lead piping. In spite of the care taken by water-supply undertakings to diminish the plumbosolvent action of certain waters, slight degrees of lead poisoning are not uncommon from this cause and are generally unrecognized. Practitioners in towns whose water-supply is drawn from upland surface waters derived from moorlands should always bear in mind the possibility of obscure cases of illness being due to lead poisoning.

REFERENCES.—<sup>1</sup>Med. Research Council, Special Report Series, No. 154, 1931; <sup>2</sup>*Goitre in School Children*, Report of the Departments of Health and Scientific and Industrial Research, Wellington, 1929; <sup>3</sup>Med. Research Council, Special Report Series, No. 123, 1929; <sup>4</sup>*Jour. of State Med.* 1929, Aug., 480; <sup>5</sup>Report of Food Investigation Board for 1930; <sup>6</sup>*Med. Officer*, 1931, Jan. 17, 31; <sup>7</sup>*Biochem. Jour.* 1930, 1433; <sup>8</sup>*Ibid.* 1931, 287; <sup>9</sup>*Lancet*, 1930, ii, 1347.

## FOOT-AND-MOUTH DISEASE. (See also VETERINARY SURGERY.)

Major Dalling, M.R.C.V.S.

**GENERAL CONSIDERATIONS.**—Foot-and-mouth disease is an acute infectious disorder met with chiefly in cattle, sheep, and pigs, although the other domesticated animals are sometimes affected, and occasionally man. It is caused by an ultra-visible virus which is conveyed from affected to healthy animals by direct or indirect methods. The virus exists specially in the lymph contained in the vesicles in the mouth, and when they rupture the virus is found in the saliva. It is also found in the milk, and is in the blood up to the time when the vesicles rupture. It is believed also to be present in all the excreta.

Two forms of the disease are recognized—simple and septicæmic. In the

simple form the death-rate is very small, being less than 5 per cent; but the financial loss from other causes—for example, complications due to foot troubles, abortions, etc., may be great. There is also the great loss due to dislocation of the live-stock trade in an affected area caused by fear of the rapid spread to healthy stock. The septicæmic form is seldom seen in this country, and when it occurs is usually due to secondary infections. Losses up to 50 per cent from such causes have been recorded.

The incubation period is about a week, and the first symptom is a rise of temperature up to 106° F., with the usual accompanying general disturbances. This is soon followed by a peculiar smacking of the lips, accompanied by a dribbling of saliva from the mouth and the formation on the inside of the lips and on the tongue of yellowish-white vesicles containing straw-coloured fluid. They soon rupture, leaving raw ulcers which gradually heal. In many cases the vesicles rupture very early in the course of the infection, so that, even at an early examination, only raw ulcers are found. Foot lesions may or may not be present. The lesions consist of vesicles similar to those found in the mouth and are situated between the hair and the hoof. They may appear prior to mouth lesions, and give rise to a characteristic type of lameness. A separation of the horn from the sensitive parts of the foot may occur. In milking-cows vesicles may also appear on the udder and teats. In pigs and sheep the foot lesions are more commonly found.

Foot-and-mouth disease exists in most parts of the world, and for the past few years Great Britain has seldom been entirely free from infection. The disease was first recognized in this country in 1839, and in 1869 it was made a notifiable disease under the Contagious Diseases of Animals Act. The 'slaughter, policy' is still carried out in connection with its eradication, and, taking everything into consideration, it is the only practical method of dealing with the disease in this country at the present time. As research progresses, it seems possible that satisfactory methods of immunization will be evolved.

During recent years much research into foot-and-mouth disease has been carried out, and at the present time a Foot-and-Mouth Disease Committee is in existence, whose function is "to initiate, direct and conduct investigations into foot-and-mouth disease, either in this country or elsewhere, with a view to discovering means whereby the invasions of the disease may be rendered less harmful to agriculture." The Committee has issued four progress reports, and the following notes are compiled from a study of them, as well as of articles published by workers in other countries, including those of Waldmann and Trautwein (Germany), Vallée, Carré, and Rinjard (France), and Lignéres (South America). The *Transactions of the Eleventh International Veterinary Congress* (1930, London), which includes sections devoted to the discussion of foot-and-mouth disease, contains much up-to-date knowledge on the subject.

#### **The Virus of Foot-and-Mouth Disease.—**

*Plurality of the Virus.*—It was Vallée and Carré who first demonstrated experimentally that two immunologically different types of foot-and-mouth disease virus existed, and subsequently Waldmann and Trautwein added a third to the list. The position to-day is that three types are recognized: they are referred to universally as the 'O', 'A', and 'C' types. There is some evidence that other distinct types may exist, but no definite statements have yet been published. The three types differ only in their immunological properties, no definite or constant differences being observed in the character of the disease set up in susceptible hosts, though the degree of virulence of any one strain for particular animal species may vary. The degree of virulence, however, bears no relation to the immunological type. The immunological differences between strains are demonstrated by the inoculation of

virus into recovered and immunized animals; by the inoculation of virus into animals previously treated with formalinized vaccine (made from virus); and by serological methods. In Europe, the 'O' type of virus predominates, and in Britain it has been shown that 90 per cent of outbreaks are caused by this variety. Atypical strains of intermediate type exist, as shown by some overlapping in immunity. The plurality of the virus accounts in some measure for the recurrence of the disease among recovered animals.

*Cultivation of the Virus.*—Until quite recently all attempts to propagate the virus outside the animal body had failed. The work of Frosch and Dahmen, who claimed to have cultivated the virus on artificial media, could not be confirmed, and up to the present artificial cultivation has not been accomplished. Very recently in this country, H. B. and M. C. Maitland devised a method of propagation by which the virus increases in amount with considerable regularity. They used small flasks containing pieces of the living tissues of embryo guinea-pigs, and added to them some filtered virus. In three or four days the virus content increased up to 100,000 times. They made sixteen subcultures without a break, and in the final flask the virus could be diluted 10,000 times and still infect guinea-pigs. Similar results are reported from Germany. Much work has also been done on the conditions of oxidation and reduction which favour the survival of the virus, and from such researches it appears that the conditions inside the living animal cell must be imitated in order to obtain growth in artificial media, the maintenance of a definite steady oxidation-reduction potential being of first importance.

*Survival of the Virus outside the Animal Body.*—The virus of foot-and-mouth disease is capable of retaining its vitality and virulence for some months when dried under favourable conditions. Under natural conditions drying may occur to a certain degree, and so the virus remains alive, and thus new outbreaks may be accounted for. The virus is excreted in the milk, urine, faeces, and saliva of infected animals for ten days after symptoms develop, and persists longest in the saliva; it has been shown that virus in the epithelium of the vesicles resists external influences to a greater degree than that contained in the vesicular fluid. The virus is highly susceptible to putrefaction and sunlight, and is easily destroyed by moist heat above 50° C.

The conditions of survival of virus on the farm and in the meat trade have been investigated in this country. Virus on skin remains active up to 105 days at -10° C. if the alkalinity on the skin is that of blood in the living body. Blood from infected animals allowed to dry at ordinary temperature (15° to 20° C.) remains infective for periods varying with the substance on which the drying takes place; thus, the virus survives only 2 or 3 days if the blood is dried on glass, iron, zinc, tile, brick, or wood, but will be found active up to 102 days if dried on boot leather or rubber from a gum boot. Again, watery filtrates of virus dried on bran remain active up to 20 weeks, while infective blood dried on the materials used for wrapping frozen or chilled carcasses was found inactive after 45 days, even when kept at  $\pm 2^\circ$  C. In milk, virus remains active for periods of 7 to 30 days at ordinary temperature, depending on the original bacterial content of the milk. Milk containing virus, and allowed to dry on pieces of wood, was inactive after 2 days at 18° C., but in milk powder it seems possible that virus is conserved for much longer periods.

*Destruction of Virus.*—From a long series of experiments it is concluded that the best disinfectants for practical purposes are those that raise the degree of alkalinity of the fluid used. In Germany reliance is placed on a 1 per cent solution of **Caustic Soda**. In this country it has been shown that a 4 per cent solution of common **Washing Soda** dissolved in water at about

60° C. is very effective and useful for utensils, floors, etc., and that the immersion of hides in a solution of **Sodium Bisulphate** (1-10,000) for five hours, or in **Sodium Bifluoride** (1-20,000) for two hours, kills the virus without causing any damage to the hide.

*Survival of the Virus in the Bodies of Animals after Death.*—In the body of animals during the height of the disease the virus is present in greatest concentration in the vesicular fluid and epithelial tissues of the mouth and feet; to a less degree in the blood; and to a still less degree in other tissues, including the bone-marrow. The effect of pickling solution of salt, nitre, etc., on the virus at ordinary temperature was shown to be destructive, but only after 49 days. Virus contained in crushed bones infected pigs by feeding after storage at -4° C. (chilling temperature) for 42 days. A series of experiments carried out with whole carcasses makes it evident that if animals at a highly infective stage of foot-and-mouth disease are killed, dressed, and stored at chilling or freezing temperature, they may remain infective for some weeks.

**Sources of Infection.**—A summary of the facts relative to the reappearance of foot-and-mouth disease after slaughter and adequate disinfection shows that out of 5554 infected centres during the last twenty years where restocking took place from four to eighteen weeks after disinfection of the premises, in 57 the disease reappeared, and in 13 of these the disease was probably re-introduced: thus in 44 centres infection appears to have persisted from the original outbreak. In Germany observations show that at least three weeks must elapse before infected premises are safe for further occupation. Much work has been done on the stages of the disease at which the greatest infection to healthy animals can take place, but under the slaughter and disinfection policy there is little chance of infection being retained in infected premises. It seems possible that the reappearance in some centres may be due to virus lying latent in the hoof of an animal. It has been shown that this may occur, and that in recovered animals virus so placed is capable of infecting up to 67 days.

It has been considered that infection in foot-and-mouth disease outbreaks comes from cases of the disease in cattle, sheep, and pigs. In the main this is true, but within recent years other animals have been shown to be susceptible to the disease. Thus man has been proved susceptible. Again, wild rats may be infected, and the disease may spread among them. Affected wild rats on infected premises have been caught, and proved to be infected with true foot-and-mouth disease virus. Wild rabbits may be infected, but in them the disease occurs as a mild infection, and has not been shown to spread among them. Hedgehogs are distinctly susceptible. Mice have resisted all attempts at infection, but cats may develop mild symptoms, and in one instance there was some evidence of spread from cat to cat. Dogs are susceptible to laboratory infection.

It would appear, therefore, that the origins of fresh outbreaks of foot-and-mouth disease may be classified as: (1) Foci of virus outside the animal body. (2) Virus carried by animals other than cattle, pigs, and sheep, e.g., rats, etc. (3) Virus contained in the carcasses of animals killed during the infective period. This is believed to account for the outbreak in America in 1929, when pigs fed with scraps of meat, 57 days after the carcasses were received in America, developed the disease.

**Immunization.**—In this country immunization methods are not practised, but they are in vogue on the Continent, and experiments are being carried out by the Foot-and-Mouth Disease Committee. Because of the plurality of the virus any method must be attended with considerable difficulty, and the various sera and vaccines used must necessarily be polyvalent. Four methods have been attempted:—



*The Use of Hyper-immune Serum.*—Hyper-immune serum has been prepared in Germany by Waldmann and his colleagues. Cattle convalescent from an attack are injected repeatedly with large doses of virus, and the three types are used, thus making the hyper-immune serum polyvalent. Large doses of the serum are used; 20 c.c. per live hundredweight is found to give protection for ten days. This work has been confirmed in this country. In France, convalescent serum is used; no attempt is made to increase its antibody content or to make it polyvalent.

*The Simultaneous Use of Hyper-immune Serum and Active Virus.*—This is a method practised in the prophylaxis of some virus diseases, e.g., hog cholera, rinderpest, and canine distemper (see DISTEMPER, CANINE). By this method the disease is not actually prevented, but the severity of the attack is diminished and the acquisition of a lasting type of resistance is induced. In practice it is found that the severity of the attack following the application of this method varies, but is seldom serious. The degree and duration of the immunity effected, however, seems to be proportional to the degree of illness produced. Again, while the animal is suffering from the mild attack it is infective to others, and in some cases it has been shown that the effect of the serum is to cause a delay in the rupturing of the vesicles and so to prolong the infective stage. When this treatment is being adopted the animals in the immediate neighbourhood are protected by injection of serum only. The method is practised in parts of Germany, especially Prussia, and is known as 'Ringimpfung'. Quarantine for a period of about five weeks is adopted after the animals are treated. It is stated that while the results are good, the method is not always effective.

*Use of Attenuated Virus.*—Virus is passed through a series of animals of another species, and is believed to be of diminished virulence for cattle. This method is not good, because of the difficulty of obtaining an attenuated virus of constant virulence.

*The Use of Formalinized Virus.*—This method was first suggested by Vallée and Rinjard, and experiments have been carried out in this and other countries. A considerable degree of resistance is produced with regularity against the strain of virus used. It is necessary to make the vaccine from virus of high potency, e.g., a dose of vaccine must contain at least 5000 to 10,000 minimum infecting doses: the supply of virus for large-scale production of virus presents considerable difficulty. Vallée used 6000 doses, and claims to have shown in controlled experiments on cattle that the results were good. Skomorokoff also reported encouraging results, but in Germany successful results were not obtained.

It appears from work in this country that there are two types of immunity—a local or tissue, and a humoral or general, variety. The development of the humoral type protects cattle against direct infection, and in the animal which has recovered from natural infection this type of immunity, as tested for by intramuscular injection of virus, has been found absolute as long as thirty-two months after recovery. The local or tissue immunity disappears more rapidly. The intradermal injection of virus is the test employed for this type of immunity.

While nothing really definite from a practical point of view has been elaborated, there appear to be good grounds for believing that satisfactory methods for both active and passive immunization will be evolved eventually.

The use of guinea-pigs, which are highly susceptible to the virus of foot-and-mouth disease, is of the utmost value to those working on the problem of immunity, but it is important that any positive findings be confirmed on cattle and other animals.

**FOREIGN BODIES IN THE EYE.** (*See EYE, FOREIGN BODIES IN.*)**FRACTURES.** (*See also EAR, AFFECTIONS OF; HEAD INJURIES; NASAL SINUSES, AFFECTIONS OF; SPINE, INJURIES OF.*)*E. W. Hey Groves, M.S., F.R.C.S.**S. J. H. Griffiths, F.R.C.S.*

The majority of suits for malpraxis are brought about as a result of alleged incompetent treatment of bone injuries, and the medico-legal aspect of fractures makes itself more apparent every year. We therefore make a plea for the X-raying not only of every suspected case of fracture but of every case where trauma has been applied to any part of the bony skeleton. It is well to remember that negative X-rays may be as valuable as positive ones.

Lionel Auster<sup>1</sup> deprecates the prevalent practice of permitting patients to see or to have their own X-ray films. One would not allow a patient to have their record cards, and he says there is an irresistible impulse on the part of most patients to show X-ray films to their neighbours, and who among the horde of viewers of that film does not know some doctor that is the only man to treat the condition as shown? No lawsuit for malpraxis can be instituted or continued without the injudicious comment of some other doctor, and his comment is often the precipitating factor in such litigation.

**GENERAL TREATMENT OF FRACTURES.**

**Irradiated Ergosterol in the Treatment of Fractures.**—The action of ultra-violet light on ergosterol is to produce vitamin D, and in this formation it is known as 'irradiated ergosterol'. This substance has been found to have almost a specific action on rickets and tetany. The possibilities in this direction in hastening callus formation occurred to Kenneth Lewis,<sup>2</sup> and he carefully studied a series of seventeen cases of fractures of the long bones. The ergosterol was given daily during the healing period, and X-rays were taken at weekly intervals and determinations of the blood-calcium and inorganic phosphates were made. He found there was slight increase in the blood calcium but none in the organic phosphate, and there was no appreciable increase in the amount of callus or in its rate of deposition, and in his series of 17 cases there were at least 2 of delayed union. He quite rightly comes to the conclusion that irradiated ergosterol does not hasten union or callus formation, and cannot be considered to have any value in the treatment of fractures, whether union be delayed or not.

**Non-union and Delayed Union.**—Fractures are long cases, and to the patient, employer, and hospital authorities they are a real financial burden. If it were not for the bugbear of non-union and delayed union, there would be shortening of convalescence and disability time, and an earlier return to work. Clan Murray suggests that of prime importance is the prevention of delayed and non-union, rather than its treatment once it has occurred, and during the last five or more years he has carefully studied the problem. He states<sup>3</sup> that as much as 60 per cent of the healing tissue which is subsequently calcified is derived from muscle and fascial planes—that is to say, from tissues outside the bone—and that any not so derived comes from the soft parts of the bone, the so-called endosteum. According to him there are four requisites necessary for the formation of bone anywhere in the adult body. They are: (1) Death of tissue; (2) Granulation tissue growth; (3) A local concentration of calcium; and (4) A proper hydrogen-ion concentration. On this conception he has been able to produce experimental myositis ossificans without the introduction of any bone elements. In a paper on delayed and non-union in fractures in the adult<sup>4</sup> he points out that delayed

union and non-union are generally phenomena of certain locations in the body and not of individual patients if reasonably proper treatment and methods are used.

Subcapital fractures of the neck of the femur are prone to non-union, and this part of the neck has really only a meagre covering of soft parts, which consist mainly of dense fibrous tissue—namely, the reflection of the capsule of the joint. These subcapital fractures never show much callus. Fractures in the intertrochanteric region are buried in vascular muscle bellies which provide a good circulation production of granulation tissue growth with rapid healing of the fracture. Again, fractures of the lower third of the tibia are slow in union, and the covering here is principally by tendinous structures which do not form a suitable nidus for granulation tissue growth. In the prevention of delayed union and non-union, Murray cites three essentials:—

1. Early and accurate replacement of fragments without interposition of soft parts.

2. The restoration to normal of lymph and vascular circulation as rapidly as possible through elevation of the part and early physiotherapy.

3. Early operative reduction for those fractures with displacement in regions prone to non-union, and he believes that such operative reduction should embody a dual procedure aimed at the threat of delayed or non-union and mal-position as well. Following reduction in such cases osteoperiosteal grafts should be placed on the fragments, fixed rigidly enough so that early active function of the part can be started. He does not believe that such a graft grows, but that it acts as a calcium source for healing granulation tissue. Murray has been experimenting by introducing an artificial calcium source—namely, a combination of powdered calcium triple phosphate and calcium carbonate, well mixed with blood. His results are encouraging, but at present his experiments are too early and few to fairly excite comment.

In those cases of delayed or non-union where there is accurate alinement and apposition—that is to say, those cases where if union would only occur the end-result would be excellent—D. B. Phemister<sup>5</sup> advises surrounding the fracture ends with osteoperiosteal strips chiselled from the tibia. The suture of the soft parts keeps the grafts in contact with the bone, and this method alone leads to bony union in a large percentage of cases.

The maintenance of reduction is by no means easy. Any splint or apparatus, no matter how simple or complicated, will fail without constant attention to what may appear to the uninitiated as mere trivialities. A skilful reduction must be followed by a patient and skilful after-care with constant observation by the surgeon himself. Skeletal traction is finding its lawful place, and in experienced hands it is superior to any other form of traction; but in the hands of the novice it is a method fraught with many difficulties and dangers.

**Closed or Open Methods ?**—The Mayo Clinic holds no preference either for the closed or for the open method of treating fractures, but adapts the method to the fracture under consideration. If operative methods are decided upon, it is advised that they should be carried out at once and not after reduction has been attempted by vigorous manipulation.

**Local Anæsthesia and Fractures.**—In the treatment of fractures the use of local **Novocain** infiltration is now universally acknowledged, and in certain cases and types it has definite advantages over general anæsthesia. Many of these advantages are apparent. To practitioners working alone the disadvantage of being without an anæsthetist is removed. The co-operation of the patient is obtained, and is then helpful as regards position and fitting of splints after the so-called setting of the fracture. The patient is able to proceed home at once. It is hardly necessary to mention the advantage of

setting some fractures under the fluorescent screen, and the one-time difficulties of this procedure are removed by means of local infiltration anaesthesia. J. P. Hosford<sup>6</sup> discusses the subject at some length, and quotes a number of successful cases. He does not advise local anaesthesia in the very young, in nervous patients, or in compound fractures. In the latter he recommends regional anaesthesia, but this is of course much more difficult. The technique for local anaesthesia is simple, and an abundance of literature appears on the subject. The principles of the method depend upon the fact that a hematoma forms around the fractured bone-ends and if a solution of novocain is injected into this hematoma it will rapidly diffuse around the fractured surfaces. In a matter of moments there is complete analgesia and muscle relaxation. The average amount of novocain required is 20 c.c. of a 2 per cent solution; no untoward effects appear after its use. The skin must be carefully prepared and the injection made under strict aseptic régime. The region of the fracture is ascertained, and the injecting needle inserted down to the bone-ends.

D. Levi<sup>7</sup> draws attention to the fact that owing to loculation of the hematoma in impacted fractures the procedure is not quite so simple. This is best shown in Colles's fracture. In such a fracture unless three injections are made—namely, one on the flexor surface, one on the extensor surface, and one around the ulnar styloid—the method of local infiltration anaesthesia may be unjustly condemned.

**Fractures of the Neck of the Femur.**—Sir Robert Jones<sup>8</sup> draws attention to the unpleasant fact that of all the fractures those of the neck of the femur have in the past received but little attention, and in many teaching hospitals the rule is to send such cases off to Poor Law Institutions, with the result that there has been an unnecessary spirit of pessimism. In the recent case he is convinced that the plaster method described by Whitman is the safest and most efficient procedure. Whitman has placed this technique on a scientific basis, and unless we follow his teaching carefully we shall be disappointed in the method. Simple abduction and fixation is not sufficient; there must be full anaesthesia, and the upward displacement of the shaft must be reduced by traction combined with full inward rotation. It is only by such manipulation that bone contact between the fragments can be obtained. This, together with the correct application of the plaster spica, which must go from the nipple line to the ball of the toes, is a method which has to be correctly mastered. In detail this consists in traction until the leg is a normal length, abduction to about 40°, and internal rotation until a radiogram would scarcely show the lesser trochanter. The thigh must be fully extended and the knee slightly bent. The plaster should remain in place for at least three months, and a walking caliper should be worn for another six to nine months. The old ununited case presents a different problem. Any operation involving the exposure of the hip-joint is nearly always accompanied by considerable shock, and cases of non-union occurring in the aged and infirm should be treated along the lines of masterly inactivity. If there is much disablement, discomfort, or pain, the bifurcation operation by transferring the weight-bearing is generally sufficient to produce relief from symptoms. The operation is simple and is not accompanied by much shock. Reconstruction operations and operations aimed at pegging the hip into place should be reserved for the younger patient.

Smith-Peterson advises operation in most cases of fracture of the hip, and his method is to insert a metal flanged nail. M. S. Henderson<sup>9</sup> is not over-impressed with Whitman's method and thinks it has many drawbacks: to mention two—the liability to pulmonary embolism from prolonged recumbency, and troublesome stiffness of the knee during convalescence.

**Fractures of the Ankle.**—We are all acquainted with that type of ankle fracture in which there is a posterior marginal fragment displaced from the tibia. The replacement of this fragment by manipulation more often fails than succeeds, and J. Gatellier<sup>10</sup> advises reduction by open operation by means of a juxtaretroperoneal route. A skin incision begins 12 cm. above the tip of the external malleolus, follows the posterior border of the fibula, and curves a little upward at the lower end of the top of the external malleolus—that is, it is a straight incision curved at the lower end. The sheath of the peronei is opened and displaced upwards. The lower fibres of the flexor longus hallucis

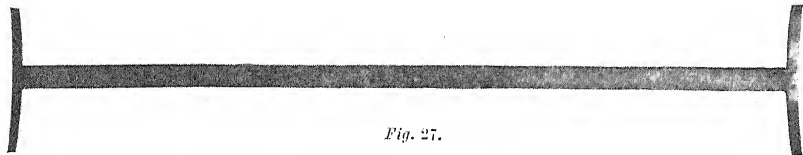


Fig. 27.

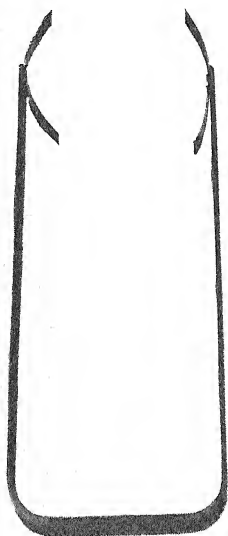


Fig. 28.



Fig. 29.

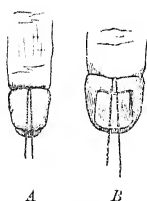
(Figs. 27-29 by kind permission of Dr. Muihern and the 'Journal of Bone and Joint Surgery'.)

are detached from the posterior surface of the fibula. The fibula is nearly always found to be fractured in these cases, and it is then turned round its tip from above downwards. With the foot in forced extension the tendo Achillis is retracted and the posterior and external surfaces of the lower end of the tibia and the posterior marginal fragment are well displayed. The posterior marginal fragment is reduced and held in position with a screw.

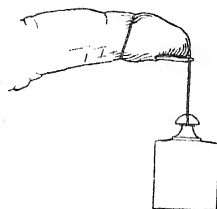
Ambulatory treatment of fractures of the lower extremity, particularly those around the ankle-joint, may be greatly facilitated by the use of the so-called **Böhler's Iron**. This has been described in Böhler's book on the treatment of fractures, but was originally mentioned many years ago by Lejars. This iron consists of a piece of stout iron, 26 in. long,  $\frac{1}{8}$  in. thick, and  $\frac{3}{4}$  in. wide,

to which are riveted at both ends two cross-pieces, 5 in. long,  $\frac{1}{4}$  in. wide, and  $\frac{3}{4}$  in. thick (*Fig. 27*). This is bent in a U-shaped manner (*Fig. 28*) and incorporated into plaster so that the curved part acts as an iron heel for weight-bearing (*Fig. 29*). According to Böhler, patients are able to get about bearing weight on the injured member a few days after the original accident.

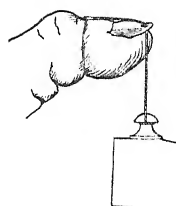
**Fractures of the Head of the Radius.**—Dislocations and fracture-dislocations of the head of the radius are not only difficult to reduce but show great



*Fig. 30.*



*Fig. 31.*



*Fig. 32.*

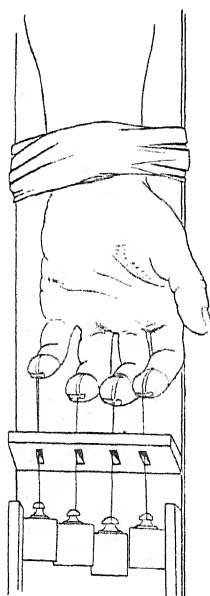
(*Figs. 30-33 by kind permission of 'Zentralblatt für Chirurgie'.*)

liability to recur after satisfactory reduction, and if reduction cannot be maintained, then excision of the head is advised. M. J. Madlener and B. Wienert<sup>11</sup> have treated 14 cases along conservative lines and 8 by operation. If by operation the fragment cannot be brought into good position and maintained without injury to the articular cartilage, removal is advisable in order to avoid late development of arthritis.

Henderson says that fracture of the head of the radius may result in marked limitation of pronation and supination, and that the head of the bone is often badly comminuted. If there is any reason to believe that a fracture of the head of the radius is badly comminuted, early excision of the head is indicated. Early excision gives excellent function, whereas late excision is often disappointing.

#### **Fractures of the Phalanges and Metacarpals.**—

Many cases of fracture of the phalanges or metacarpals can only be properly treated by traction. It is well understood how difficult it is to obtain good traction of the fingers. Adhesive plaster is the method generally adopted, but it is apt to slide, and collodium or mastisol is not much better. The transfixion of the terminal phalanx with a nail or knitting needle is much more satisfactory, but it is difficult; painful, and not without its risks of infection with resultant necrosis of the terminal phalanx. G. Tschalenko,<sup>12</sup> writing from Leningrad, suggests applying extension by means of a stout thread fixed to the finger by a clove hitch and the two ends passed through holes drilled in the nail. The hand is slung to a frame and



*Fig. 33.*

weight extension applied to the thread. Each finger will take a weight of 150 to 160 grm. by this method. (*Figs. 30-33.*)

REFERENCES.—<sup>1</sup>*Med. Jour. and Record*. 1931, April 1, 341; <sup>2</sup>*Ann. of Surg.* 1930, Sept., 415; <sup>3</sup>*Minnesota Med.* 1930, March, 137; <sup>4</sup>*Ann. of Surg.* 1931, May, 961; <sup>5</sup>*Surg.*

*Gynecol. and Obst.* 1931, Feb., 376; <sup>6</sup>*Brit. Jour. Surg.* 1931, April, 546; <sup>7</sup>*Practitioner*, 1930, Dec., 738; <sup>8</sup>*Brit. Med. Jour.* 1931, i, 781; <sup>9</sup>*Ann. of Surg.* 1931, May, 968; <sup>10</sup>*Surg. Gynecol. and Obst.* 1931, Jan., 67; <sup>11</sup>*Arch. f. klin. Chir.* 1931, March, 591; <sup>12</sup>*Zentralb. f. Chir.* 1930, No. 43, 2660.

### FUNGOUS AFFECTIONS OF THE SKIN. (See SKIN, FUNGOUS AFFECTIONS OF.)

#### GALL-BLADDER, SURGERY OF. *A. Rendle Short, M.D., F.R.C.S.*

**Bacteriology.**—G. Gordon-Taylor and L. E. H. Whitby<sup>1</sup> found, as others have done, that organisms are much more frequently present in the wall of the gall-bladder than in the bile or in the gall-stones. *B. welchii* was found in 9 out of 50 consecutive cases. The common organisms were *Streptococcus faecalis* and *B. coli*.

**Acute Cholecystitis.**—R. H. Miller<sup>2</sup> advises operation without delay in these cases, as they are generally due to a stone blocking the cystic duct, and natural drainage is poor. He has seen perforation of the gall-bladder take place in two such patients whilst waiting for the infection to subside. It is true that one may have to content oneself sometimes with a drainage operation, when by waiting for a quiet interval a cholecystectomy would have been possible. Of 200 cases at the Massachusetts General Hospital, 27 died (13.5 per cent). Half the fatal cases were drained; in the rest the gall-bladder was removed.

H. F. Graham<sup>3</sup> writes to the same effect. Of 198 cases treated at Brooklyn, 20 were operated on within forty-eight hours, 1 died, and convalescence was quick and easy. Of 178 cases operated on after forty-eight hours, 11 died, and convalescence was often long or complicated.

[We believe that it is quite good practice to operate for acute febrile cholecystitis seen within twenty-four hours, if there have been previous attacks. Quiet interval surgery is so much safer than operation *à chaud*, that on the second and following days it is better to wait. If the patient is definitely getting worse, or fever persists for a week, one has to intervene and under difficult circumstances. A very quick cholecystostomy, through a transverse incision, under gas or local anaesthesia, is usually successful.—A. R. S.]

**The Gall-bladder after Cholecystostomy.**—B. L. Fleming<sup>4</sup> obtained cholecystograms of 36 patients who had been treated by cholecystostomy and drainage. All but one were abnormal, but half the cases were free from symptoms. This confirms what has been found by others.

**Diagnosis of Gall-stones.**—According to E. Rosenthal,<sup>5</sup> of Buda-Pesth, diagnosis can be aided by inducing paravertebral anaesthesia of IX, X, and XI thoracic segments on the right side, which abolishes pain sensations derived from the gall-bladder, but not from the other abdominal organs. The method is particularly useful in atypical cases.

**Stones in the Ducts.**—P. Klingenstein<sup>6</sup> relates five cases of stone in the common duct without jaundice or fever. Many surgeons must have had a similar experience.

E. S. Judd and J. M. Marshall,<sup>7</sup> of the Mayo Clinic, writing on stones impacted in the ampulla of Vater, admit that it is often difficult to feel the stone from outside the duct; it may have to be opened and explored with a probe or finger. If possible, the stone is then pressed up from outside, aided by a scoop inside. Occasionally it is necessary to open the duodenum, but very seldom. The duct is drained by a T tube. E. Horgan<sup>8</sup> prefers an L-shaped tube for common-duct drainage, it being easier to remove. H. M. Clute,<sup>9</sup> of the Lahey Clinic, Boston, points out that the risks of removing stones in the common duct can be greatly reduced by a two-stage operation, when

the jaundice and obstruction are of long standing. The first operation is to drain the gall-bladder. R. P. Rowlands<sup>10</sup> advocates the opinion, to which surgeons in general are coming, that for irremovable obstructions **Cholecyst-gastrostomy** is easier, safer, and better than cholecystoduodenostomy or cholecystjejunostomy.

**Technique.**—B. Desplas and J. Meillère<sup>11</sup> describe a method of avoiding leakage as long as a gall-bladder is being drained. They insert a Pezzet tube, and close the gall-bladder around it in the manner of the lobster-pot method of making a gastrostomy (*Plate XII*); a flanged tube is then slipped over the Pezzet tube and affixed to the skin with adhesive plaster (*Fig. 34*).

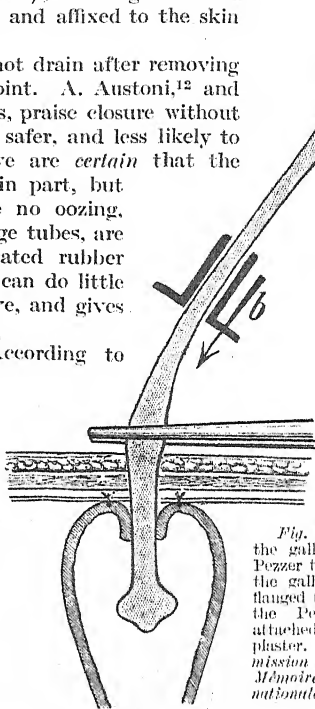
Whether one should or should not drain after removing the gall-bladder is still a moot point. A. Austoni,<sup>12</sup> and G. Cotte and H. Roland,<sup>13</sup> of Lyons, praise closure without drainage on the grounds that it is safer, and less likely to be followed by adhesions. [If we are *certain* that the cystic duct is securely tied, not in part, but the whole, and that there will be no oozing, we agree. Gauze packs, or drainage tubes, are objectionable. A strip of corrugated rubber dam left in for twenty-four hours can do little or no harm, is not painful to remove, and gives us a feeling of security.—A. R. S.]

**Post-operative Bleeding.**—According to R. R. Linton,<sup>14</sup> there is no alteration in the blood-calcium in cholemic cases, nor has calcium chloride administration any theoretical or practical advantage. The effectual method of preventing post-operative bleeding is repeated **Blood Transfusions**, and a high carbohydrate intake. E. Siegmund<sup>15</sup> found that the risk of fatal oozing was greatly reduced by a pre-operation blood transfusion. W. Walters,<sup>16</sup> at the Mayo Clinic, uses intravenous **Calcium Chloride** and also blood transfusion, and if necessary repeats the transfusion after the operation.

**Persistent Biliary Stenosis or Fistula.**—O. Goetze<sup>17</sup> relates three successful cases in which he restored the continuity of the bile-passages by raising a tubular flap from the duodenum and joining it to the hepatic duct. [A similar procedure was described and figured in the *MEDICAL ANNUAL* for 1931 (p. 205).—A. R. S.]

W. Walters<sup>18</sup> relates 5 cases in which an external biliary fistula was transplanted into the stomach or duodenum for the relief of massive stricturing of the common duct. Two were very successful, 2 improved, and 1 died. If there is persistent obstructive jaundice but no external fistula, one is created at a first operation, and implanted into the stomach or duodenum some months later.

F. H. Lahey<sup>19</sup> describes and illustrates the same procedure. He has had 10 cases, with 6 successes and 2 deaths. The fistulous track may be 'cored out' of the abdominal wall (*Plate XV*), but should not be dissected from the



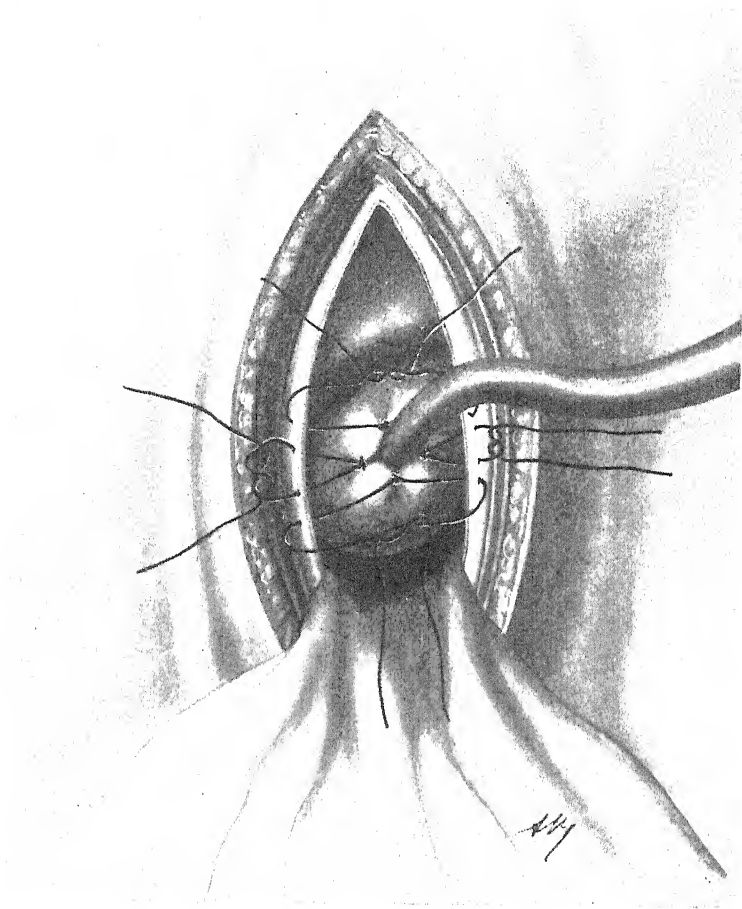
*Fig. 34.*—Drainage of the gall-bladder. *a*, A Pezzet tube inserted into the gall-bladder; *b*, A flanged tube slipped over the Pezzet tube and attached to the skin by plaster. (By kind permission of *Bulletins et Mémoires de la Société nationale de Chirurgie*.)



## PLATE XIV

### DRAINAGE OF THE GALL-BLADDER

(B. DESPLAS AND J. MEILLÈRE)



A Pezzer tube is inserted, and the gall-bladder is closed round it in the manner of a gastrostomy.

*By kind permission of  
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Société nationale de Chirurgie'*

## PLATE XV

### TREATMENT OF BILIARY FISTULA

(F. H. LAHEY)

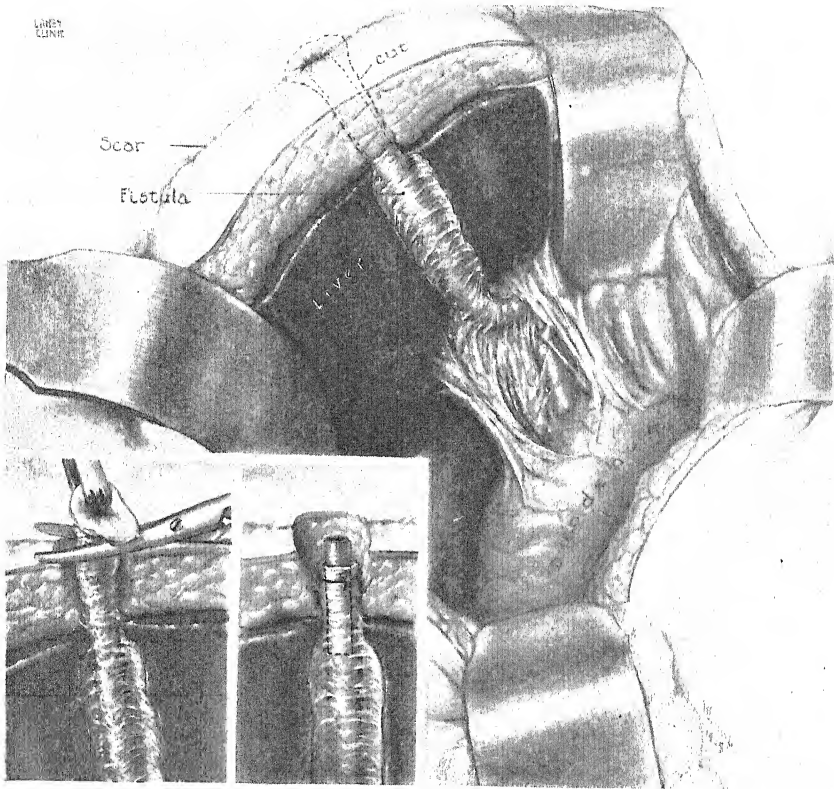


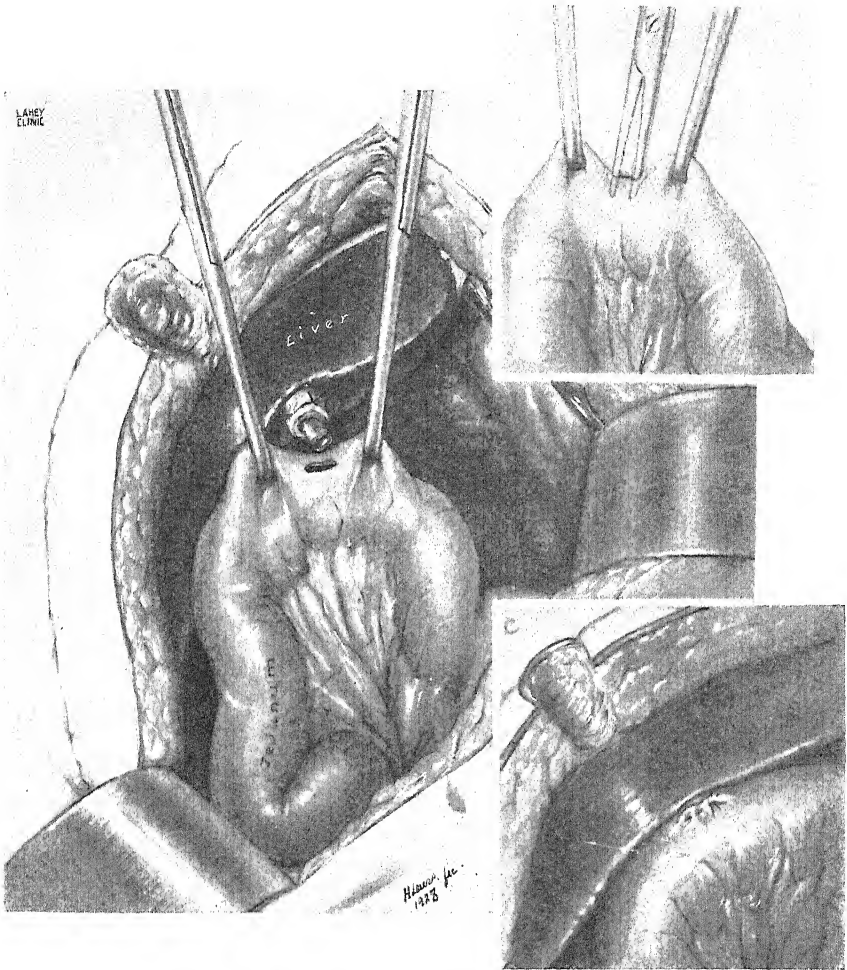
Fig. A.—Showing diagrammatically the fistulous tract running along the bed of the liver and in dotted lines the plan of coring it out of the abdominal wall. Insets show the fistulous tract corrod out of the abdominal wall; in one the button of skin is being cut away; in the other, the small section of rubber tubing is tied into the end of the fistulous canal.

*Plates XV and XVI by kind permission of  
'Annals of Surgery'*

## PLATE XVI

### TREATMENT OF BILIARY FISTULA—*continued*

(F. H. LAHEY)



*Fig. B.*—The anterior surface of the liver freed from the parietal peritoneum and turned down to meet the jejunum (or pre-pyloric gastric region) pulled up, with the opening in the intestinal canal into which the sinus is to be transplanted. One inset shows a method of making an opening when jejunum is used; the other inset shows fistula transplanted and bowel pulled well up against the liver edge so that there is no free fistula.

liver. It is therefore necessary to mobilize the stomach, duodenum, or jejunum to come up to meet it (*Plate XVI*). A rubber tube is used to make the junction. The stomach, if available, is the most suitable organ to receive the fistula.

**Statistics.**—H. E. Santee<sup>20</sup> (New York) reports 299 operations for gall-stones, mostly cholecystectomy, with a mortality-rate of 6.3 per cent. Of 26 common-duct cases, 20 per cent died. Clute<sup>9</sup> had 74 common-duct cases, with 6.7 per cent deaths. Of 850 gall-bladder operations reported by Siegmund,<sup>15</sup> 5.4 per cent died. R. L. Sanders,<sup>21</sup> of Memphis, Tennessee, gives the elaborate table reproduced on p. 193 of a follow-up by himself and seven other surgical writers. The disparities are singularly wide.

**Cancer of the Gall-bladder.**—E. A. Graham<sup>22</sup> believes that this is not a rare disease, but constitutes from 8 to 10 per cent of all carcinomas. [This is not our experience.—A. R. S.] He deduces from this that the gall-bladder ought to be removed earlier in gall-stone cases.

**Adhesions between the Gall-bladder and the Duodenum.**—This common and troublesome complaint is discussed in a paper by G. Mazzacuva,<sup>23</sup> of Genoa. The pain after food, and some deformation of the duodenum with delay in emptying, may point to the correct diagnosis. The author has good results from cholecystectomy with removal of the adhesions. (*See also DUODENUM, SURGERY OF—PERIDUODENITIS.*)

REFERENCES.—<sup>1</sup>*Brit. Jour. Surg.* 1930, July, 78; <sup>2</sup>*Ann. of Surg.* 1930, Oct., 644; <sup>3</sup>*Ibid.* 1931, June, 1152; <sup>4</sup>*Ibid.* March, 730; <sup>5</sup>*Políclínico*, 1930, Dec., 592; <sup>6</sup>*Ann. of Surg.*, 1931, June, 1146; <sup>7</sup>*Jour. Amer. Med. Assoc.*, 1930, Oct., 1061; <sup>8</sup>*Ann. of Surg.* 1931, June, 1162; <sup>9</sup>*Jour. Amer. Med. Assoc.* 1930, Nov., 1568; <sup>10</sup>*Surg. Gynecol. and Obst.* 1930, Dec., 844; <sup>11</sup>*Bull. et Mém. Soc. nat. de Chir.*, 1930, Dec., 1395; <sup>12</sup>*Clin. Chir.* 1930, June, 630; <sup>13</sup>*Rev. de Chir.* 1931, Jan., 1; <sup>14</sup>*Ann. of Surg.* 1931, March, 707; <sup>15</sup>*Deut. Zeits. f. Chir.* 1931, Feb., 353; <sup>16</sup>*Ann. of Surg.* 1931, June, 1137; <sup>17</sup>*Deut. Zeits. f. Chir.* 1930, Nov., 1173; <sup>18</sup>*Jour. Amer. Med. Assoc.* 1931, April, 1121; <sup>19</sup>*Ann. of Surg.* 1930, Oct., 649; <sup>20</sup>*Ibid.* 1931, June, 1156; <sup>21</sup>*Ibid.* 1930, Sept., 376; <sup>22</sup>*Ibid.* 1931 Jan., 317; <sup>23</sup>*Políclínico*, 1930, Aug., 382.

## GANGLION.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Ganglia of the wrist or elsewhere may be ruptured by the old-fashioned method of a sharp resolute blow with a book. This results in obliterating the sac in a certain proportion of cases, but there are a good many recurrences. Ganglia are easily removed under local anæsthesia. The hand is flexed and the subcutaneous tissues are injected with a 1 per cent novocain solution or 1-1000 percaïne with adrenalin. Asepsis must of course be ensured. P. McEvedy<sup>1</sup> draws attention to the injection treatment of ganglion as a third method. He gets extremely satisfactory results by the injection of **Sodium Morrhuate**. A small quantity of local anæsthetic is injected with a fine needle into the skin at the side of the ganglion. A needle of moderate bore is inserted at this point and the contents of the ganglion are aspirated. Sometimes the contents will only pass through the needle by pressing firmly on the ganglion. With the needle still in position 5 per cent sodium morrhuate is injected, the quantity varying from 0.5 to 2 c.c. After the injection the ganglion may reach its former size again and there is mild pain for a day or two. After a few days it gradually disappears. A second injection may be necessary. [The reviewer thinks that excision of ganglia is less troublesome than injection and the cure is certain, but the operation must be carried out under conditions where asepsis is assured.—W. I. de C. W.]

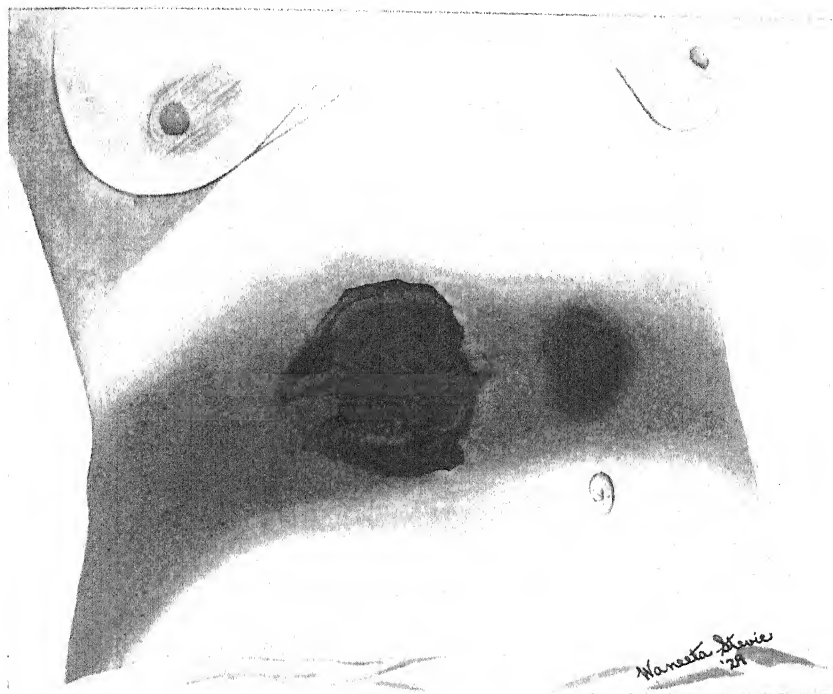
REFERENCE.—<sup>1</sup>*Lancet*, 1930, ii, 902.

**GANGRENE.** (*See also* DIABETES; DIPHTHERIA; SYMPATHETIC NERVOUS SYSTEM, SURGERY OF.)

*PLATE XVII*

GANGRENE OF THE SKIN FOLLOWING OPERATION

(L. FREEMAN)



Water-colour drawing made about 16 hours post mortem.

*By kind permission of 'Annals of Surgery'*



**GANGRENE OF THE SKIN FOLLOWING OPERATIONS.***Sir W. I. de C. Wheeler, F.R.C.S.I.*

L. Freeman<sup>1</sup> deals with progressive, gangrenous, painful ulceration of the abdominal skin and subcutaneous tissue following operation. This serious affection fortunately is rare. Most of the cases occur in connection with suppurating wounds such as are seen after operations for appendicitis. No general causative disease is present. A characteristic feature is almost unendurable pain and tenderness. The course of the trouble is slow, lasting for weeks or months unless checked by surgical means. In a case mentioned the wound had healed by primary union, the infecting agent apparently gaining access on the eleventh day through a stitch-hole. The extreme pain suggests a lesion of the nerves or their spinal ganglia, similar to that occurring in herpes zoster. (*Plate XVII.*)

The only way to prevent the relentless spread of the trouble seems to be the use of the **Actual Cautery** going well beyond the red margin into sound skin, and burning a gutter down to the subcutaneous tissues. In addition, the entire diseased area may be cauterized.

M. Ballin and P. F. Morse<sup>2</sup> also refer to progressive post-operative gangrene of the skin. F. N. Gordon is quoted as saying that it occurs practically always following operation for appendiceal abscess, the ulceration spreading from the site of operation over the abdominal surface on the third to the tenth day. The ulcer is described as carbuncular-like. It resists treatment and spreads rapidly. This superficial gangrene should be distinguished first from common wound infection, erysipelas, and from sloughing gangrene due to gas-bacillus infection. The gangrene discussed by these two writers does not extend deeper than the skin.

Antiseptic solutions are of little use in treatment, and X rays, etc., have not given uniformly good results. The best method consists in cutting round the undermined edges with an **Electrocautery Knife**, excising in this way the whole serpiginous edge of the process. It is not necessary to cauterize the middle of the defect.

REFERENCES.—<sup>1</sup>*Ann. of Surg.* 1930, Oct., 779; <sup>2</sup>*Amer. Jour. Surg.* 1931, Jan., 81.

**GAS GANGRENE.***Sir W. I. de C. Wheeler, F.R.C.S.I.*

H. Milch<sup>1</sup> discusses the treatment of gas gangrene. A prophylactic dose of polyvalent **Gas-gangrene Antitoxin** in conjunction with **Tetanus Antitoxin** is now procurable. The cost is its main disadvantage. Wherever possible, either local, spinal, or nitrous oxide gas should be used as the anæsthetic of choice. The production of acidosis favours the development of a gas infection, and treatment should be along lines to prevent this.

REFERENCE.—<sup>1</sup>*Ann. of Surg.* 1931, June, 1220.

**GAS-BACILLUS INFECTION.***Sir W. I. de C. Wheeler, F.R.C.S.I.*

R. R. Linton,<sup>1</sup> dealing with this subject, comes to the following conclusions: (1) Gas-bacillus infection may develop in any case of gangrene of the lower extremity resulting from impaired circulation, regardless of the age of the patient or whether the gangrene is moist or dry or the skin is intact or broken. (2) Conservative treatment, including delay for the appearance of a definite line of demarcation, if carried too far in these cases, is dangerous, because of possible gas-bacillus infection in the gangrenous extremity. (3) Skiagrams of the affected limb may show gas deep in the muscle planes that cannot be detected by palpation. (4) In any suspected case of gas-bacillus infection, immediate amputation is imperative. (5) In such cases, unless there is evidence of good circulation below the knee, it is much safer to amputate through the

thigh. (6) In cases with a definite gas-bacillus infection in the lower leg, either before or after a primary amputation, the operation of choice is a guillotine amputation through the lower third of the thigh, with no attempt at closure of the stump.

REFERENCE.—<sup>1</sup>*Jour. Amer. Med. Assoc.* 1930, July 19, 183.

### GASTRIC ANALYSIS.

Robert Hutchison, M.D., F.R.C.P.

There has been a reawakening of interest lately in the 'alkaline tide' (originally described by Bence Jones) as a method of studying gastric acidity, and papers on the subject have been published by R. S. Hubbard<sup>1</sup> and by M. J. Matzner and Irving Gray.<sup>2</sup> It is found that when a 'tide' is present in the urine after a meal HCl can almost always be found in the gastric juice, and that in about 80 per cent of those subjects who show no alkaline tide HCl is either absent or very scanty. There are, however, certain limitations to the usefulness of the test. It seems to be impossible to distinguish by it between normal secretion and over-secretion. It is valueless also in the presence of cystitis or nephritis.

*Histamine* continues to be largely used as a stimulant of gastric secretion and as a means of distinguishing between true and false achlorhydrias. Its effect on ferment production is disputed. B. P. Babkin<sup>3</sup> finds that histamine chiefly stimulates acid production and that the ferment-producing cells are largely unaffected by it; D. T. Davies and T. G. James,<sup>4</sup> on the other hand, assert as the result of their own observations that histamine stimulates pepsin production as well as HCl secretion. These authors investigated the gastric secretion in 100 normal subjects between the ages of 60 and 95. They found, as might have been expected, that whilst 43 showed a normal and only 13 a raised secretion, in all the rest the secretion was diminished and in 32 there was achlorhydria, half of which were shown by histamine injection to be cases of true achlorhydria. Atrophic changes in the mucous membrane of the tongue and anæmia were commoner in those with a diminished secretion. This, again, is what one would expect, but it leaves undetermined the question whether the anæmia is the consequence of the diminished secretion or the cause of it.

It is now generally believed that the gastric acidity, the form of the acidity curve, and the emptying-rate of the stomach are to some extent 'constitutional' and run in families. F. L. Apperly<sup>5</sup> has investigated the question in 31 families comprising 86 individuals, and his results confirm the above belief.

REFERENCES.—<sup>1</sup>*Arch. of Internal Med.* 1930, Dec., 994; <sup>2</sup>*Ibid.* 1931, Jan., 58; Feb., 202; <sup>3</sup>*Canad. Med. Assoc. Jour.* 1930, Aug., 268; <sup>4</sup>*Quart. Jour. Med.* 1930, Oct., 1; <sup>5</sup>*Brit. Med. Jour.* 1931, i, 255.

### GASTRIC SYPHILIS. (See also SYPHILIS.)

Robert Hutchison, M.D., F.R.C.P.

This condition, as David Smith<sup>1</sup> points out, has received little attention in Great Britain. It is necessary to distinguish between gastric symptoms occurring in a syphilitic subject and actual gastric syphilis, for it must be remembered that both ulcer and cancer occur far more often in syphilitic patients than gumma does.

The disease may take several different forms: (1) Multiple ulcers (gummas); (2) Single ulcers; (3) Diffuse gummatous infiltration; (4) Nodular ulcerative lesions; (5) Chronic interstitial fibrosis; (6) Nodule; (7) Linitis plastica. (It is better, however, to reserve the term 'linitis plastica' for small-cell carcinoma and to speak instead of the 'fibrosed syphilitic stomach'.) The rarity of any of these forms is shown by the fact that P. A. O'Leary,<sup>2</sup> using



the material of the Mayo Clinic, was able to find only 89 cases of gastric syphilis amongst nearly 25,000 syphilitic patients.

**DIAGNOSIS.**—The following are the criteria required to justify a diagnosis of gastric syphilis: (1) Symptoms definitely pointing to disease of the stomach or duodenum must be given. (2) X-ray examination must show evidence of such disease. (3) The Wassermann reaction must be positive. (4) The symptoms must not yield at all to a 'try-out' of recognized treatment for peptic ulcer. Proof of the cases being genuine is furnished if: (1) Symptoms clear up rapidly under light or ordinary diet in conjunction with intensive anti-syphilitic treatment. (2) X-ray examination shows improvement or recovery. (3) The Wassermann reaction becomes negative or less positive. It will be observed that confirmation of the diagnosis in the cases is obtained by assuming that the lesions are probably neoplastic, inflammatory, or ulcerative conditions in otherwise syphilitic subjects. O'Leary warns against continuing the therapeutic test too long. If the symptoms do not begin to clear up quickly, it is wiser to explore.

**SYMPTOMS.**—The most frequent symptom is constant pain referred to the upper abdomen. The character of the pain varies from a mild discomfort to agonizing cramp-like seizures, which are superimposed on the general distress in the upper abdomen and come on some hours after food. These seizures are mostly unrelieved by taking food, but are somewhat relieved by vomiting. The underlying general distress is not at all alleviated by vomiting. In all cases the pain, whatever its character may be, is progressive, and the periodic remissions so frequently met with in gastric and duodenal ulceration are absent. In character, therefore, it more closely simulates the distress of gastric carcinoma. Nausea and vomiting are frequent symptoms. Hæmatemesis and melaena are rare. Anorexia is common, and this, with the constant vomiting, leads to loss of weight, marked anæmia, and some degree of cachexia. The anæmia is often extreme, although there is no apparent loss of blood. Cachexia is not so marked as in cases of carcinoma. A palpable tumour is sometimes present, definite X-ray deformity is seen, and a test-meal shows achlorhydria, except where there is pyloric stenosis. The possibility of syphilis should certainly be considered in all atypical cases of gastric disease or where ordinary treatment fails.

**PROGNOSIS.**—Smith regards this as good, but O'Leary says that it is not as good as is thought. Of his 89 cases, only 37 per cent were cured and 27 per cent improved.

**TREATMENT.**—Treatment can be ambulatory, unless the physical condition of the patient is too low. Food should be given in a manner that will not irritate the stomach, but almost any kind of food can be taken. Meat should be minced, fish and fowl creamed, fruit and vegetables given as purées, and bread, etc., should be toasted so as to be crisp and require mastication. **Neokharsivan** in doses varying from 0.3 to 0.9 gm. is given in one, two, or more courses, as the individual case requires. **Potassium Iodide** has a marked effect, and doses up to 30 gm. three times a day should be administered. **Mercurial Inunction** should also be freely used. Iodide and mercury should be given, with short periodic rests, even after physical signs and symptoms have disappeared.

**REFERENCES.**—<sup>1</sup>*Brit. Med. Jour.* 1930, ii, 773; <sup>2</sup>*Amer. Jour. Surg.* 1931, Feb., 286.

## GASTRIC ULCER.

Robert Hutchison, M.D., F.R.C.P.

It is generally believed that gastric and duodenal ulcers are rare in the black races. S. Bergsma,<sup>1</sup> however, has found ulcer to be quite common in the natives of Abyssinia. He attributes this to the large amount of red pepper they eat.

**TREATMENT.**—N. Hypher<sup>2</sup> describes a simple ambulant treatment for gastric ulcer. The patient's work is restricted or he is told to take a holiday for four to eight weeks. During the first week the diet consists of bread and milk, and a mixture containing 15 gr. each of bis. carb., mag. carb. lev., and calc. carb., suspended with mucilage, is taken every four hours. The author attaches value to the suspension of the alkalis by the mucilage as enabling them to remain in contact with the ulcer even when the patient is standing up; otherwise the powder settles down on the greater curvature. The diet is gradually modified week by week by the addition of eggs, fish, custard, meat, and cereals, until after a month a normal diet is being taken. He has shown the filling up of the ulcer on X-ray examination under this treatment in two cases. The treatment certainly has the merit of simplicity, but it is difficult to believe that the results it yields would be permanent.

K. Westphal and W. Kuckuck<sup>3</sup> describe as a drawback to intensive alkaline treatment what they call 'alkali-achylia'. From their observations it would seem that after the administration of an alkali (especially after sod. bicarb.) there is only a transient fall in acidity, followed by a rise which may exceed the previous level. If the dose is repeated at short intervals (as in the Sippy plan) the gastric glands become exhausted and a condition of achylia results. In spite of this they have found that an ulcer does not necessarily heal, but the characteristic ulcer pain is replaced by a dull continuous ache. These authors prefer **Atropine** in the treatment of ulcer, giving 1 mgrm. three times daily. They consider the use of alkalis overdue and that they should be given only for the relief of pain and not for months and years together and in a routine fashion. They prefer **Calcined Magnesia** or **Magnesium Perhydrol** to other alkalis.

REFERENCES.—<sup>1</sup>*Arch. of Internal Med.* 1931, Jan., 144; <sup>2</sup>*Practitioner*, 1931, Feb., 272; <sup>3</sup>*Münch. med. Woch.* 1931, Sept. 12, 1792.

## GASTRIC ULCER, PERFORATED. *A. Rendle Short, M.D., F.R.C.S.*

**Methods of Operating.**—Dickson Wright<sup>1</sup> argues for a small incision, about an inch long, medial vertical, in the pyloric plane. A spinal anaesthetic is used. The peritoneal exudate is sucked up by the electric aspirator, and the perforation located with the finger. The incision is then pulled towards the perforation, which, when it is brought into sight, is closed by two stout catgut threads passed through-and-through, and reinforced by sewing a piece of omentum on top. This method of closure, without invagination, is quite adequate. The advantages claimed are: freedom from post-operative pain, which reduced the risk of pneumonia; elimination of wound-complications; and quick convalescence, the patient being able to go home in ten days. Of course, if the perforation cannot easily be found, the incision can be enlarged.

J. H. Watson (Burnley)<sup>2</sup> excises the perforated ulcer locally and also divides the pyloric sphincter.

**Operation Mortality.**—Statistics have been published during the year by J. H. Watson, J. W. Hinton<sup>3</sup> (New York), J. M. T. Finney and E. M. Hanrahan<sup>4</sup> (Baltimore), B. Giovanni<sup>5</sup> (Rome), and L. Zukschwerdt and T. Eck<sup>6</sup> (Heidelberg). J. M. Blackford and J. W. Baker<sup>7</sup> have assembled the collected records of thirteen (mostly American) surgeons. These figures are given in the table on p. 199.

The figures collected by Blackford and Baker show that the mortality for cases operated on under 12 hours is 15 per cent, for those operated under 12 to 24 hours is 32 per cent, and for those after 24 hours 71 per cent. A follow-up of 37 cases by Hinton showed 22 satisfactory, 10 fair, and 5 needed a second operation. In the Baltimore series 91 per cent were well (of 34 traced).

DEATH-RATE AFTER OPERATION FOR PERFORATED  
GASTRODUODENAL ULCER.

AUTHORITY	CASES	DEATHS
		Per cent
Watson .. .. .	110	19.1
Hinton .. .. .	100	20
Finney and Hanrahan	56*	26.8
	53†	18.9
Giovanni .. .. .	100	44
Zukschwerdt and Eck	112	37
Thirteen surgeons ..	954	22

\* Gastric ulcer.      † Duodenal ulcer.

*Resection for Perforated Ulcer.*—We reported last year in the *MEDICAL ANNUAL* (p. 215) the advocacy of resection, by Judine of Moscow. It has been taken up zealously by certain German clinics, and papers appear on the subject by S. Judine<sup>8</sup> again, W. Küchel,<sup>9</sup> M. Richard,<sup>10</sup> H. Kunz,<sup>11</sup> and G. Eichelter.<sup>12</sup> S. Judine reports 51 cases resected, of whom 6 died (11.9 per cent); during the same period 25 cases were operated on but not resected; the total mortality in the 76 cases was 22.3 per cent. Local anæsthesia was used. W. Küchel performed resection on 15 of his 30 cases, and lost 2 (13.5 per cent). The method followed was the Billroth II. M. Richard, reporting 21 cases without a death from Basle, quotes 447 patients with perforated ulcer operated on in five clinics, with a mortality of 17.2 per cent. At H. Kunz's clinic, out of 115 cases (total mortality 25.2 per cent), 54 were resected, and only 4 died, that is, 7.4 per cent. G. Eichelter reports 78 cases of perforated ulcer with a mortality of 23.5 per cent; of these 41 were treated by resection, and 17 per cent died.

[We are not convinced that resection is good treatment, in spite of these excellent figures. Naturally it was the patients who would probably get well anyhow who were resected; it is likely enough that some of those who died might have been saved if less had been done. In our opinion there is more to be gained by reducing the operation to a minimum, as Dickson Wright suggests, than by extending it to a maximum, with the Moscow and Central European surgeons.—A. R. S.]

REFERENCES.—<sup>1</sup>*Proc. Roy. Soc. Med.* 1931, May, 979; <sup>2</sup>*Brit. Med. Jour.* 1930, ii, 169; <sup>3</sup>*Surg. Gynecol. and Obst.* 1931, May, 778; <sup>4</sup>*Ann. of Surg.* 1930, Oct., 620; <sup>5</sup>*Poliklinico.* 1930, Nov., 521; <sup>6</sup>*Deut. Zeits. f. Chir.* 1931, May, 299; <sup>7</sup>*Amer. Jour. Surg.* 1931, April, 18; <sup>8</sup>*Arch. f. klin. Chir.* 1930, Sept., 517; <sup>9</sup>*Deut. Zeits. f. Chir.* 1930, Sept., 505; <sup>10</sup>*Zentralb. f. Chir.* 1931, Jan., 149; <sup>11</sup>*Arch. f. klin. Chir.* 1930, July, 399; <sup>12</sup>*Ibid.* 400.

### GASTRODUODENAL ULCER, SURGERY OF.

A. Rendle Short, M.D., F.R.C.S.

We may perhaps be permitted to remark that the voluminous literature turned out year by year on this subject is becoming rather wearisome. Little that is new emerges. On the other hand, we ought to be grateful for the extraordinarily large and ever-growing statistical material available. There is no branch of surgery in which we have anything like the same wealth of data for considering mortalities or end-results.

*BACTERIOLOGY.*—E. W. Saunders,<sup>1</sup> of New York, found the same streptococcus in nineteen resected ulcers of the stomach and duodenum, not identical with germs found in appendicitis or cholecystitis, but identical with strains producing ulcers of mucous membranes and skin. Patients with gastric ulcer, in his experience, all have this organism's specific agglutinins in their blood.

It will not grow in bile, which is theoretically in favour of those operations which admit bile to the stomach. W. Hayek,<sup>2</sup> of Vienna, on the other hand, says that enterococci are so constantly found in the stomach that streptococci are probably of no special significance.

**SYMPTOMS AND DIAGNOSIS.**—J. Morley and E. W. Twining<sup>3</sup> found that in twenty-five cases of chronic ulcer the maximum deep tenderness was directly over the ulcer, and probably due to sensitiveness of the parietal peritoneum on account of contact with the inflamed area of stomach.

According to J. A. Hartwell and R. K. Felter,<sup>4</sup> our means of diagnosis by skiagraphy have so improved that a definite lesion was found in 96 per cent of 174 cases.

**Hæmatemesis.**—W. Hinton,<sup>5</sup> of New York, presents a report on 52 cases of sufficiently severe hæmatemesis or melæna to confine patients to a hospital. Six cases died without operation, and 4 more after operation for bleeding ulcer. Of the 6 non-operated cases, in 4 there was no history of any previous gastric trouble. The conclusion is arrived at that 2 of the patients operated on would have lived if medical treatment had been followed. Cases with chronic recurring hæmorrhages can usually be controlled by conservative treatment.

#### TREATMENT OF GASTRIC AND DUODENAL ULCER.

The huge body of figures available has been analysed by A. Rendle Short,<sup>6</sup> who gives the various statistics from British, American, and Continental clinics and concludes as follows:—

1. Until about ten years ago the diagnosis of gastric and duodenal ulcer, unless verified by perforation, operation, or necropsy, was so precarious that the older statistics of medical treatment are untrustworthy.

2. Spontaneous healing can undoubtedly occur and is not infrequent. Perforation and hæmorrhage are marks of the chronic rather than the acute ulcer. About 25 per cent of cases of peptic ulcer bleed. Perforation is common in ulcers of the anterior wall and usually occurs within a year or two of the onset; only a few, under 3 per cent, of ulcers of the posterior wall, of long standing, perforate.

3. The medical treatment of gastroduodenal ulcer, in the best clinics, gives good immediate results. At least 75 per cent become symptom-free. Only 40 per cent remain so. From 15 to 20 per cent of the patients will die within ten years. If the duration of symptoms was under a year, more than half the patients remain well; over a year, far fewer.

4. Obviously, therefore, efficient medical treatment should have a good trial. Equally obviously, a considerable number of the patients ought eventually to be operated on. Mechanical obstruction, or a large, deep ulcer that may be malignant, demands early operation.

5. The mortality and end-results of gastrojejunostomy are set forth fairly, in an adequate number of cases treated by rank-and-file surgeons, followed up for at least four years, in the B.M.A. Collective Report. The operation mortality for duodenal, pyloric, and gastric ulcer was 5, 2.6, and 9 per cent. The follow-up, for both gastric and duodenal ulcer, showed 90 per cent of successes (75 per cent perfect) and about 4 per cent of failures. Secondary gastrojejunal ulcers followed in 2.8 per cent of the duodenal and 0.8 per cent of the gastric cases. Subsequent cancer was rarely, if ever, reported.

6. Individual English surgeons report a lower mortality (1 to 2 per cent in duodenal and 3 to 4 per cent in gastric cases). End-results are about the same as in the Collective Report, except that when a gastric ulcer is not removed the cure-rate is at least 10 per cent lower.

7. Continental and American results for gastrojejunostomy are, for some reason not well understood, far less satisfactory. The mortality is about the same as in the Collective Report, but only 50 to 70 per cent are cured, and 20 to 30 per cent do badly.

8. Pyloroplasty gives results very similar to those of gastro-enterostomy.

9. Partial gastrectomy is advocated to avoid gastrojejunal ulcer or cancer, and to obtain a larger percentage of cures. Gastrojejunal ulcer in England follows gastrojejunostomy in 0.4 to 3.4 per cent of the patients operated on. Cancer follows in about 2 per cent of the cases. After partial gastrectomy, gastrojejunal ulcer follows in about 0.6 per cent of cases. Some anæmia may result from an extensive gastrectomy—mild in nearly half, serious in perhaps 10 per cent; in a few cases, quite severe.

10. The operative mortality of partial gastrectomy for gastric ulcer is from 4 to 10 per cent. Excellent results are obtained in about 80 per cent; poor results in 5 per cent.

11. Except in cases of large, deep, adherent gastric ulcers, which call for a resection, the results of partial gastrectomy for gastric ulcer are no better than those of simple gastro-enterostomy, in spite of a doubled operation mortality. They are not as good as those of gastro-enterostomy with wedge excision of the ulcer. This apparently does not hold good on the Continent or in America, owing to the poor results following gastrojejunostomy in those countries. The end-results of this operation on 100 doctors at the Mayo Clinic, however, accord well with the figures obtained by English surgeons.

12. In cases of duodenal ulcer, partial gastrectomy or duodenectomy gives results no better than those of the B.M.A. report on gastrojejunostomy, and the mortality is higher. Local excision of the ulcer, by itself, gives poor results (57 per cent cured, 19 per cent no better). Local excision with partial resection of the pyloric sphincter is better, but not as good as gastrojejunostomy.

13. The deductions for treatment are: (a) If mechanical obstruction is not present, and cancer can be excluded with confidence, efficient medical treatment ought to be given a fair trial. (b) If it fails, or recurrence takes place, operation is indicated. For gastric ulcer the best operation is gastro-enterostomy with local removal of the ulcer. If the ulcer is large, deep, and adherent, a partial gastrectomy is often better. (c) For simple pyloric stenosis, gastrojejunostomy is best. It is safe and satisfactory. (d) For duodenal ulcer, gastrojejunostomy is the best treatment. If the ulcer is readily accessible it should be excised.

R. Wanke,<sup>7</sup> of Kiel, points out that patients under twenty with gastric ulcer ought only to be operated on for perforation or stenosis. Patients whose ulcer cannot be demonstrated by X rays should not be subjected to surgical treatment.

V. Pauchet and P. l'Helias<sup>8</sup> extol the advantages of opening the mucosa with a diathermy knife, after inserting one row of seromuscular sutures to approximate the stomach and jejunum.

M. Corachan,<sup>9</sup> of Santa Cruz, relates several cases in which the common bile-duct was wounded in the course of a gastrectomy. In two of his own, suture with catgut was successful.

K. Friedbacher,<sup>10</sup> of Düsseldorf, gives a corrected account of von Haberer's method of performing the Billroth I excision of the stomach. The anæsthetic may be ether, or splanchnic. After the stomach has been freed, cut off from the duodenum, and lifted to the left, the inside of the duodenum is inspected to make certain that no ulcer remains (this is the commonest cause of failure to cure). Then the back wall of the stomach is approximated to the posterior wall of the duodenum, and they are sutured together, commencing at the two

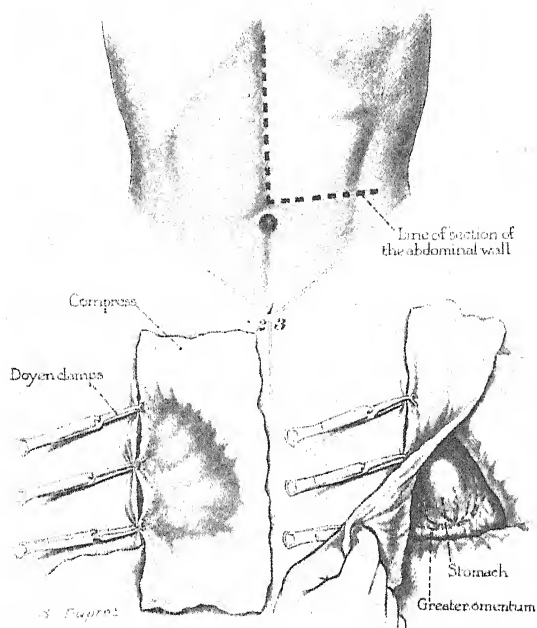


Fig. 35.—L incision turned to the left. Fixation of the operative fields.

(Figs. 35-40 by kind permission of 'Surgery, Gynecology and Obstetrics'.)

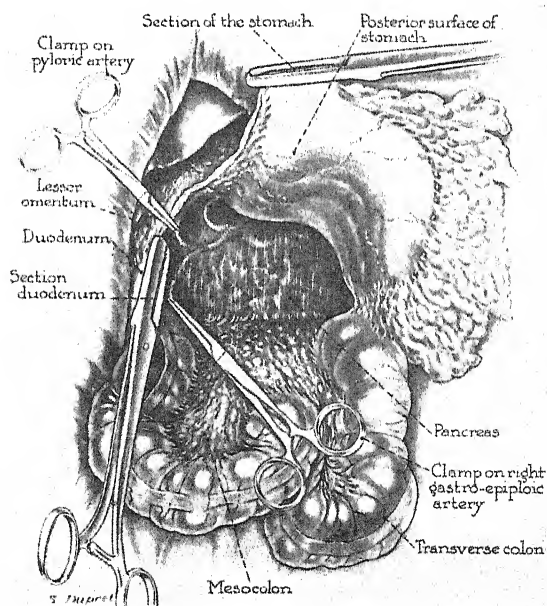


Fig. 36.—The duodenum has been cut and the lesser omentum sectional. The three arteries to be ligated are the right gastro-epiploic, pyloric, and coronary of stomach.

corners above and below. The stomach is cut away after the first layer of stitches is inserted. The ordinary suture-lines are reinforced by a through-

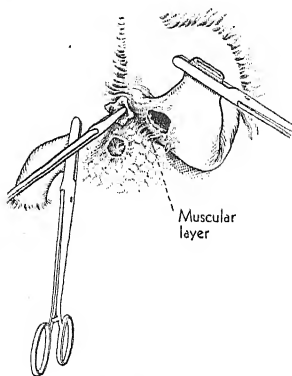


Fig. 37.

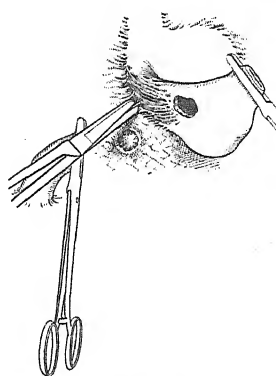


Fig. 38.

Fig. 37.—The base of the ulcer can be seen on the anterior surface of the pancreas. The stomach is dissected free by means of a tampon which is mounted on forceps.

Fig. 38.—As the adhesions become firmer scissors are taken to section them.

and-through lock-stitch, and the lumen of the stomach is brought to equal that of the duodenum.

A. Winkelbauer<sup>11</sup> describes a method of end-to-side anastomosis of the stomach to the duodenum *below* the ampulla of Vater, for duodenal ulcer, to prevent recurrence. Four cases are described; 2 died.

J. Hohlbaum,<sup>12</sup> of Leipzig, describes a technique for dealing with ulcers close to the cardia. The abdomen is opened by an incision along the left costal margin, and the gastro-colic omentum widely divided to afford access to the back of the stomach. Its posterior wall is then separated from the floor of the ulcer on the pancreas or spleen, and the hole in the stomach wall closed by a double layer of sutures reinforced with omentum. The ulcer is not actually excised. Or the ulcer may be approached by incising the anterior wall of the stomach,



Fig. 39.—The stomach is held by three forceps, and the incision, which permits of economical resection combined with removal of the ulcer, is traced on the mucous membrane of the anterior surface.

separating the stomach from the floor of the ulcer, and sewing up the gap. The base of the ulcer should be drained. He quotes seven successful cases.

V. Pauchet and G. Luquet,<sup>13</sup> of Paris, write on the same subject. They use a method called **Groove-resection**. The parts resected are the pylorus, pyloric antrum, and lesser curvature including the ulcer up to the left side of the

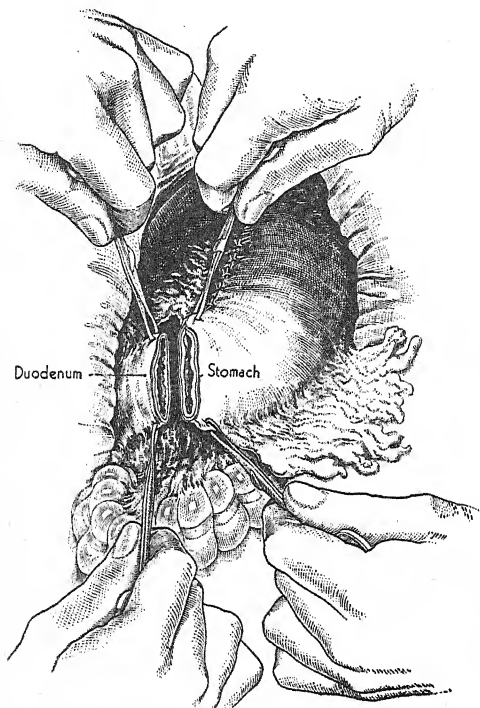


Fig. 40.—The stomach, whose calibre is reduced to that of the duodenum, is placed in contact with the latter in order to make a P<sub>an</sub> anastomosis (Billroth I).

have had 7 deaths in 44 cases; and of 22 followed up, 17 were very good and 4 good.

**Duodenal Ulcer.**—C. A. Pannett<sup>14</sup> returns to his advocacy of resection of the pylorus and duodenum for duodenal ulcer. He has operated in this manner on 85 cases; 2 died. Of 38 followed up, 81.5 per cent are absolutely well. He has been much less successful with gastrojejunostomy (8.5 per cent deaths, and only 61.5 per cent good results). Lord Moynihan<sup>15</sup> wrote the following week to dissent. He has had the marvellous result of 1000 gastrojejunostomies with only 1 death, and, for duodenal ulcer, over 90 per cent good results. As E. R. Flint<sup>16</sup> points out, the massed statistics of the B.M.A. report, by far the best available, show 91 per cent cures.

H. Finsterer, of Vienna, and F. Cunha,<sup>17, 18</sup> discussing the surgical treatment of duodenal ulcer, point out that resection is a simple matter when the ulcer is anterior, but far more difficult for posterior ulcers invading the pancreas. It is better to detach the duodenum from the floor of the ulcer and leave it *in situ*. Drainage is absolutely essential. If the ampulla of Vater or bile-duct

cardiac opening. The steps are shown in the accompanying illustrations (Figs. 35-40—in the original paper there are thirty-two figures!).

The abdomen is opened by a vertical-plus-horizontal incision, the posterior wall of the stomach exposed, the duodenum divided, lesser omentum sectioned, and coronary artery tied high up. The ulcer is opened by separating the stomach from the pancreas, and the stomach contents are aspirated. The stomach is then cut away, without clamps, as in Fig. 39, including the ulcer area, and a mooring-stitch is inserted between the oesophageal opening and the ulcer and held by forceps to prevent retraction of the stump of the stomach. A 'groove' of the stomach is thus left along the greater curvature. The lesser curvature is reconstituted by stitches and the end of the groove-stomach sewn to the duodenum, or if they will not meet easily, to the jejunum. The authors



# PLATE XVIII

## SURGICAL TREATMENT OF DUODENAL ULCER

(H. FINSTERER and F. CUNHA)

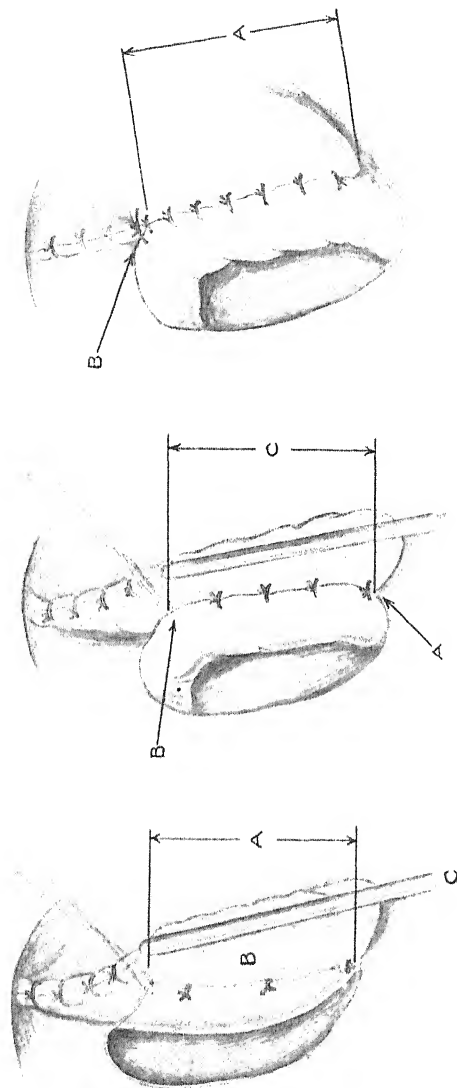


Fig. A.

Fig. B.

Fig. C.

Fig. A.—A, Left border of incision line; B, Posterior wall of stomach; C, Clamp on lower 10 cm. of resected stomach edges to be used in anastomosis.  
 Fig. B.—A, First layer of Lembert sutures; B, Approximate point of first suture; C, Width of anastomosis.  
 Fig. C.—A, Anastomosis completed; B, First three-angled suture.

Plates XVIII and XIX by kind permission of  
 Surgeon, Gynecology and Obstetrics

# PLATE XIX

## SURGICAL TREATMENT OF DUODENAL ULCER—continued

(H. FINSTERER and F. CUNHA)

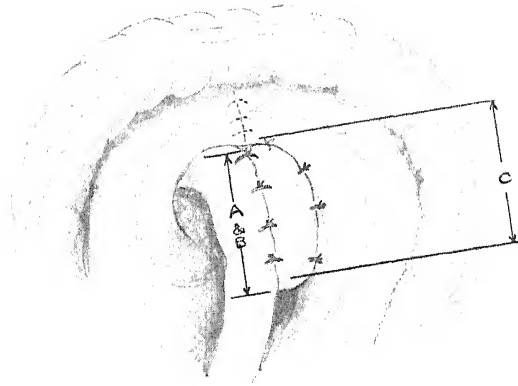


Fig. D.—A, Anastomosis lying below mesocolon in free abdominal cavity; B, Line of anastomosis; C, Left border of mesocolon slit sutured to posterior stomach wall.

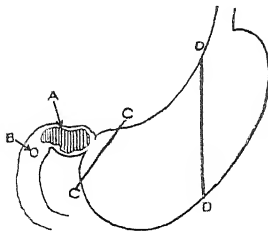


Fig. E.

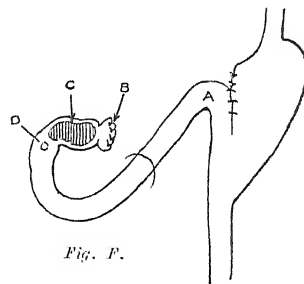


Fig. F.

Fig. E.—Finsterer resection (antrum left *in situ*). A, Ulcer; B, Papilla; C, Line of resection, leaving antrum and pylorus; D, Typical line for resection of stomach.

Fig. F.—A, Showing typical anastomosis and position of the afferent loop; B, Pylorus left *in situ*; C, Ulcer; D, Papilla.

is adherent to the ulcer, it is better to do the resection for exclusion, but pylorectomy is only safe if the first part of the duodenum is free and can be closed securely. To get satisfactory permanent results, the partial gastrectomy must be made far to the left, so that from a quarter to a third of the stomach remains. The best anastomosis is Finsterer's modification of the Billroth II operation, the jejunum being quite slack. This is shown in *Plates XVIII, XIX*. The special object is to prevent retrograde filling of the duodenal loop. Finsterer has performed 566 resections for duodenal ulcer, with a 3.1 per cent mortality. He nearly always operates under local anaesthesia. The end-results show 93.4 per cent cases well.

A. A. Strauss<sup>19</sup> and four collaborators, of Chicago, advise subtotal gastrectomy by the Pólya method, for duodenal ulcer that does not respond well to medical treatment. They believe that gastrojejunostomy is followed by gastrojejunal ulcer in 16 to 23 per cent of cases, and especially after a duodenal ulcer that has perforated. Their mortality for the resection in 221 cases is 5.4 per cent; 95 per cent of those followed up are symptom-free.

E. Starr Judd and M. Hazeltine,<sup>20</sup> of the Mayo Clinic, have been seeking a safer and more satisfactory method than gastro-enterostomy for cases of duodenal ulcer easily accessible on the anterior wall. They have been practising a local excision, combined in their later cases with removal of the anterior part of the pyloric sphincter. Of 361 cases, 4 died (1.1 per cent); a follow-up showed 90 per cent of good results. If multiple ulcers are present, or if the duodenum is not freely mobile, gastrojejunostomy is better. In young patients, the local excision is preferable. Excision is suitable for about 50 per cent of the cases of duodenal ulcer.

We referred last year (p. 211) to the method of resection of the anterior portion of the pyloric sphincter for duodenal ulcer, favoured by J. B. Deaver and V. G. Burden.<sup>21</sup> They bring their series up to 81, and have had good results, and no recurrence of ulceration. The method is of course simpler than a gastro-enterostomy, and sequelae are fewer.

**Mortality and End-results.**—Many further statistical tables have been published since the summary given in Rendle Short's paper. J. H. Gibson,<sup>22</sup> of Philadelphia, reports 224 operations for duodenal ulcer (nearly all gastro-enterostomy) with 21 deaths. (This is higher than in most English clinics.)

A. J. Walton<sup>23</sup> gives the following serial tables:—

Simple gastro-enterostomy	..	..	690 cases; 2.0 per cent died
		(last 290	0.0 " " " " )
Gastro-enterostomy + wedge-resection of			
gastric ulcer	..	244	3.6 " " "
Partial gastrectomy	..	246	15.0 " " "

In the wedge-resection series, 1 got a recurrent ulcer, and 3 developed cancer. After partial gastrectomy, there were several cases of grave anaemia.

D. G. Balfour,<sup>24</sup> of the Mayo Clinic, publishes the results of a study of the condition of patients five years after gastrojejunostomy for ulcer.

Of 500 cases of duodenal ulcer:—

1.8	per cent died	
69.0	" " perfect result	}satisfactory
18.0	" " fair result	
13.0	" " poor	
4.28	" " died in the five-year period (average death-rate in the community would be 3.1 per cent)	
9.0	" " had some bleeding after, and 1 died	

None perforated. Recurrent ulcers were 4 per cent, of which 3.26 were jejunal.

Of 100 cases of *gastric ulcer* :—

3	per cent	died	} satisfactory
50	..	..	
29	..	..	
17	..	..	
		cured	
		slight symptoms	
		poor	

Hæmorrhage took place in 9 per cent, and 1 perforated, and 6 developed cancer. The deaths were 17, as against an average in a similar community of 6. There were 3 recurrent ulcers, not jejunal.

J. M. T. Finney and E. M. Hanrahan<sup>25</sup> assemble the experience of thirty years' surgery at Baltimore. This, of course, is the home of Finney's pyloroplasty, never popular elsewhere.

<i>Duodenal ulcer</i> :—	CASES	PER CENT	PER CENT
Gastro-enterostomy ..	170	10.6 died	89.6 satisfactory
Pyloroplasty .. ..	149	2.7 ..	86.8 ..
Total .. ..	339	7.1 ..	86.4 ..
<i>Gastric ulcer</i> :—			
Gastro-enterostomy ..	90	3.0 ..	76.0 ..
Pyloroplasty .. ..	102	8.8 ..	83.9 ..
Partial gastrectomy ..	59	15.3 ..	88.2 ..

J. S. Horsley<sup>26</sup> (Richmond, Virginia) finds that of 163 cases of gastric and duodenal ulcer treated by gastrojejunostomy, 1.8 per cent died and 82 per cent were nearly or entirely cured of their symptoms. Pyloroplasty, 84 cases, gave a mortality of 3 per cent, and only 45 per cent had a satisfactory end-result.

N. Hortolomei,<sup>27</sup> of Jassy, Roumania, has the poor opinion of gastro-enterostomy which is usual in Central Europe; of 174 cases (gastric and duodenal ulcer), 4 per cent died soon after the operation, 9.7 per cent more remotely, and only half of the survivors were well. Of 90 resections 6.6 per cent died.

Turning now to the end-results of partial gastrectomy, J. M. Meherin,<sup>28</sup> of San Francisco, has performed 171 resections by the two Billroth methods (for details of these operations see MEDICAL ANNUAL, 1927, p. 195), with the following results :—

<i>Billroth I.</i> —113 cases, 9.1 per cent died.	
Duodenal ulcer ..	52 per cent cured, 13 per cent greatly improved
Gastric ulcer ..	58 .. .. 11 .. ..
<i>Billroth II.</i> —58 cases, 13.8 per cent died.	
Duodenal ulcer ..	52 per cent cured, 12 per cent greatly improved
Gastric ulcer ..	60 .. .. 23 .. ..

A. A. Berg,<sup>29</sup> of New York, is an ardent advocate of resection for gastric ulcer, following a technique of the Pólya type.

Primary partial gastrectomy .. ..	405 cases, 7.9 per cent died
(add 6 cases with very high ulcer: 4 died)	
Secondary partial gastrectomy .. ..	105 .. 20.9 .. ..
(patient having already had an operation on stomach)	

Six patients turned up with a recurrent ulcer. Absence of HCl in the stomach is by no means always secured by this operation; it can, however, be obtained if at the same time the left vagus nerve is cut on the front of the œsophagus at the cardia. Berg has done this in 16 cases, when the acidity was known to be high, with no increase of the risks of the operation. If the patient is anæmic before operation, it may take a year for the blood to recover, but he has never seen pernicious anæmia follow. [We have.—A. R. S.] In his clinic, the end-results of gastro-enterostomy have been extraordinarily bad.

R. Wanke<sup>7</sup> gives some end-results of the treatment of gastroduodenal ulcer by non-operative means.

Of 432 cases (confirmed by X rays in 67) { 28 per cent well  
seen two to ten years afterwards { 25 „ „ better  
47 „ „ poor

Poor results constituted 33 per cent in recent cases (under six months); 61 per cent in cases of ten years' standing. Of 204 unsatisfactory cases, 144 still complained of their symptoms, 35 came to operation, and 23 died.

Partial gastrectomy (Billroth I method) was performed on 318 patients :—

56 per cent were cured  
17 „ „ „ improved  
15 „ „ „ not improved  
12 „ „ „ died

We sum up the year's published statistics by concluding that they agree well with those studied in Rendle Short's monograph. Pyloroplasty presents no advantage over gastro-enterostomy. The results of gastro-enterostomy are still strangely variable; in England and some American clinics, good; in other American and European clinics, poor. Partial gastrectomy carries a death-rate of from 6.6 to about 10 per cent, and leaves 15 to 30 per cent little or no better. Medical treatment in Germany gives much the same end-results as in England.

**Failures after Operation.**—According to F. Jaeger,<sup>30</sup> recurrence of ulceration is commoner after the Billroth II type of resection than after other methods have been followed, because a 'blind sac' may be left. Some gastric ulcers are surgically incurable, but they are rare.

F. Starlinger,<sup>31</sup> writing on the same subject, has collected the records of many clinics, and finds 173 cases of recurrent ulcer out of 25,647 patients treated by partial gastrectomy, that is, 0.7 per cent. In the great majority, the new ulcer was at the line of anastomosis. There were rather more after the Billroth I operation (0.9 per cent) than after the Billroth II (0.6 per cent). Numerous methods of re-operating are mentioned, the general principle being to excise the ulcer and change the type of anastomosis.

Hertel,<sup>32</sup> writing on the causes of failure after resection of the stomach for gastroduodenal ulcer, points out that gastrojejunal ulcer is an infrequent source of trouble; chronic gastritis is more often responsible. The part played by adhesions is doubtful; they are only absent in 13 per cent of the cases. Chronic pancreatitis has to be considered, and spastic states of contraction. The less found at the operation, the more likely is it that symptoms will persist.

According to H. von Haberer,<sup>33, 34</sup> the main causes of poor results are a resection without adequate pathological cause, as for chronic gastritis, and a faulty technique, such as a too limited removal, perhaps even leaving the pylorus behind, or taking too much and leaving too small a stomach. Inadequate supervision of the patient's dietary afterwards may also play a part. F. W. Lapp and H. Neuffer<sup>35</sup> lay stress on the need for careful dieting after a gastric resection.

C. Henschen,<sup>36</sup> of Basle, writes on the blood-picture after gastrectomies, and the means of avoiding resection-anæmia. In 62 out of 77 cases the blood was normal. In 13 cases there was lymphocytosis. Only in 3 was there an undoubted secondary anæmia. In 8 cases with a low hæmoglobin count before operation it came up to normal afterwards. There were no cases of typical pernicious anæmia. He advises a vegetable diet with plenty of fat and sour milk, a pepsin mixture, and liver-feeding as a prophylactic, and an examination of the stools for worms.

G. Armitage<sup>27</sup> describes a case of intestinal obstruction following gastro-jejunostomy. It is pictured in *Plate XX*.

REFERENCES.—<sup>1</sup>*Ann. of Surg.* 1930, Aug., 222; <sup>2</sup>*Arch. f. klin. Chir.* 1930, July, 426; <sup>3</sup>*Brit. Jour. Surg.* 1931, Jan., 376; <sup>4</sup>*Ann. of Surg.* 1930, Oct., 602; <sup>5</sup>*Ibid.* 1931, April, 844; <sup>6</sup>*Brit. Med. Jour.* 1931, i, 435; <sup>7</sup>*Deut. Zeits. f. Chir.*, 1930, Sept., 41; <sup>8</sup>*Arch. méd. belg.* 1930, Nov., 745; <sup>9</sup>*Rev. di Chir. di Barcelona*, 1931, Jan., 65; <sup>10</sup>*Surg. Gynecol. and Obst.* 1930, Sept., 378; <sup>11</sup>*Arch. f. klin. Chir.* 1930, July, 439; <sup>12</sup>*Ibid.* 1930, Nov., 574; <sup>13</sup>*Surg. Gynecol. and Obst.* 1930, Sept., 367; <sup>14</sup>*Lancet*, 1931, i, 1235; <sup>15</sup>*Ibid.* 1931, i, 1235; <sup>16</sup>*Ibid.*; <sup>17</sup>*Surg. Gynecol. and Obst.* 1931, June, 1099; <sup>18</sup>*Arch. f. klin. Chir.* 1930, Nov., 582; <sup>19</sup>*Jour. Amer. Med. Assoc.* 1930, Dec., 1883; <sup>20</sup>*Ann. of Surg.* 1930, Oct., 563; <sup>21</sup>*Ibid.* Oct., 533; <sup>22</sup>*Ibid.* 616; <sup>23</sup>*Lancet*, 1931, i, 1070; <sup>24</sup>*Ann. of Surg.* 1930, Oct., 558; <sup>25</sup>*Ibid.* 620; <sup>26</sup>*Ibid.* 545; <sup>27</sup>*Presse méd.* 1930, Aug., 1057; <sup>28</sup>*Amer. Jour. Surg.* 1931, May, 260; <sup>29</sup>*Ann. of Surg.* 1930, Sept., 340; <sup>30</sup>*Arch. f. klin. Chir.* 1930, Aug., 233; <sup>31</sup>*Ibid.* Nov., 564; <sup>32</sup>*Zentralb. f. Chir.*, 1930, Dec., 3176; <sup>33</sup>*Ibid.* Sept., 2309; <sup>34</sup>*Ibid.* 1931, April, 958; <sup>35</sup>*Deut. Zeits. f. Chir.* 1931, May, 345; <sup>36</sup>*Arch. f. klin. Chir.*, 1930, Nov., 622; <sup>37</sup>*Brit. Jour. Surg.*, 1930, July, 154.

**GAUCHER'S DISEASE.** (See ANEMIA, SPLENIC.)

**GERMAN MEASLES.** (See RUBELLA.)

### GLANDULAR FEVER.

J. D. Rolleston, M.D., F.R.C.P.

**EPIDEMIOLOGY.**—K. Scheer<sup>1</sup> reports a small family epidemic in which a woman and 3 of her children aged from 4 to 7 were affected, and an epidemic in a children's home at Frankfurt, in which 43 infants and young children, or about 63 per cent of the inmates, as well as 2 nurses, were attacked. There were probably a number of abortive cases which escaped notice. Throat smears almost invariably showed a pure culture of feebly hamolytic streptococci. Almost all forms of the disease were represented, but in only 5 cases was the attack serious. No deaths, however, of which there are only 4 on record, including one from septicæmia, took place.

J. I. Moir<sup>2</sup> reports an outbreak of 87 cases which occurred in 1926 among a very isolated community in the Falkland Islands; 52 were males and 35 females. The ages ranged from 2 to 70. As is the rule in isolated communities, old persons were as liable to infection as the young, and suffered more acutely from the attack. Among several immigrants, none of whom gave a history of glandular fever, only 2 contracted the disease, although they were closely associated with the natives in whom the incidence of the disease was high.

**ETIOLOGY.**—J. O. W. Bland<sup>3</sup> found that inoculation of the blood from a human case of glandular fever into a rabbit was followed by a disease which was transmitted to other rabbits by citrated blood and was characterized by anæmia, leucopenia, monocytosis, and enlargement of the lymphatic glands, spleen, and liver, with production of local necroses. Further examination, however, will be required before the identity of the human and experimental disease can be established.

REFERENCES.—<sup>1</sup>*Monats. f. Kinderheilk.* 1930, xlviii, 59; <sup>2</sup>*Brit. Med. Jour.* 1930, ii, 822; <sup>3</sup>*Lancet*, 1930, ii, 521.

**GLYCOSURIA.** (See DIABETES.)

**GOITRE.** (See also ENDOCRINOLOGY; FOOD AND THE PUBLIC HEALTH; HYPERTHYROIDISM.)

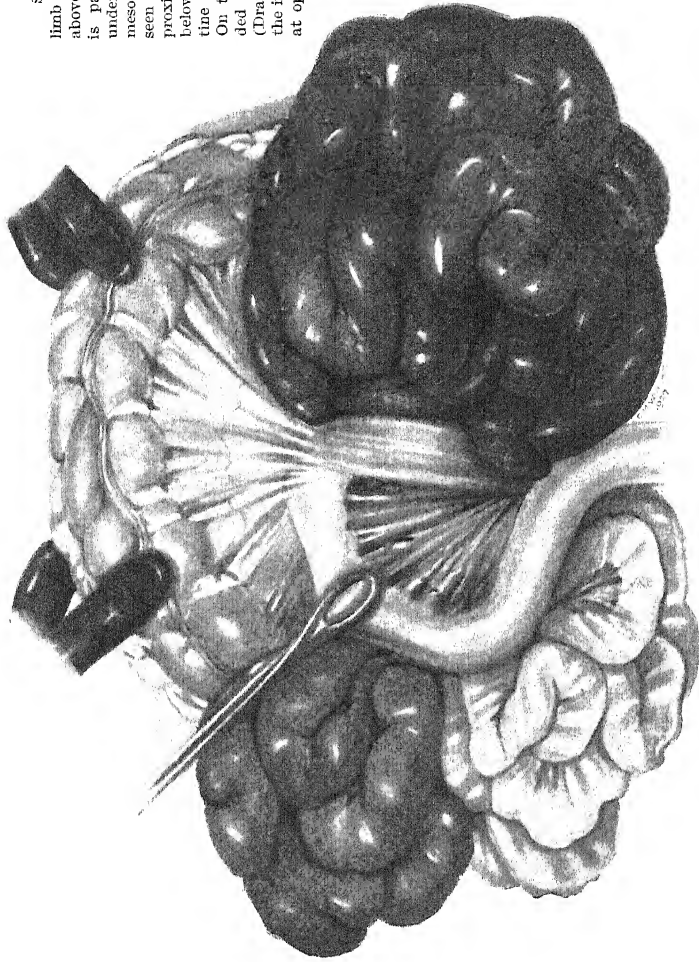
Sir W. I. de C. Wheeler, F.R.C.S.I.

In operating for goitre, the reviewer<sup>1</sup> has found many of the *anæsthetic screens* attached to operating-tables unsatisfactory. The arms of the screen come in the way of the surgeon's forearm during ligation and division of the superior thyroid arteries. The screen illustrated (Weiss & Co.) (*Figs.* 41, 42),

# PLATE XX

## OBSTRUCTION AFTER GASTROJEJUNOSTOMY

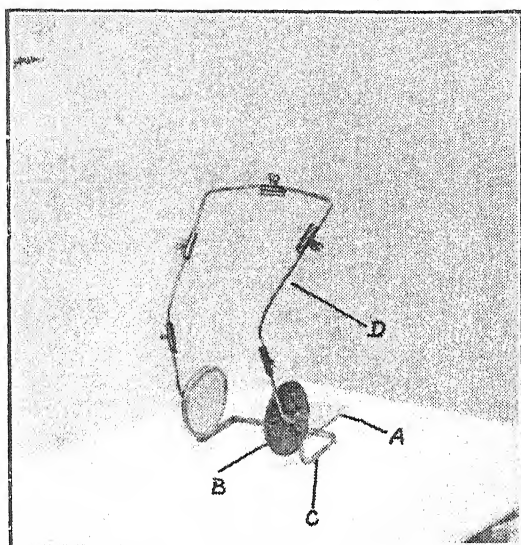
(G. ARMITAGE)



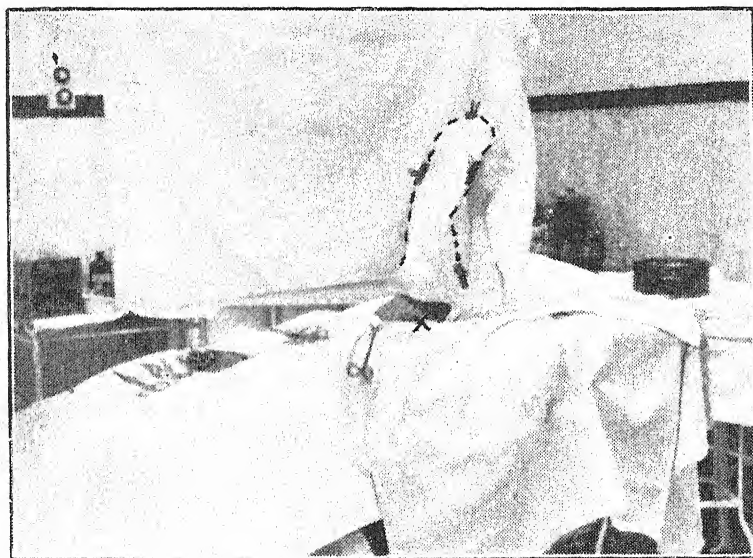
Showing the short afferent limb of the gastrojejunostomy above which the small intestine is passing between it and the under aspect of the transverse mesocolon. On the left, above is seen the dilated small intestine proximal to the obstruction, and below the collapsed small intestine distal to the obstruction. On the right is seen the distended gangrenous (small intestine. (Drawn at autopsy after replacing the intestine in the position found at operation.)







*Fig. 41.*—A, Plate for sandbag; B, Circular pads to grasp head about the ears; C, Sliding frame; D, Wire screen.



*Fig. 42.*—Screen in position. X, Goitre. The dotted line indicates the wire covered with gauze. A towel is held up for photographic purposes

*(Figs. 41 and 42 by kind permission of the 'British Medical Journal'.)*

designed by the writer, clamps on to the patient's head and is steadied by a small sand-bag on the platform marked A. A towel is placed round the patient's head and the screen clamped in position just behind the ears. When the sterilized operating sheets are in position, a large abdominal wipe is thrown over the screen and held by the paper-clips used in connection with Thomas's splint. The screen can be inclined backwards towards the anaesthetist to any extent.

H. Cohen<sup>2</sup> has performed thyroidectomy twelve times under *spinal anaesthesia*, and strongly recommends it. The cases included five simple and seven toxic goitres. He injects the spinal anaesthesia into the second to fourth lumbar interspace, using one ampoule of cocaine. He does not employ ephedrine.

E. I. Greene<sup>3</sup> deals with the question of temporary *paralysis of the recurrent laryngeal* nerves following thyroidectomy. The slightest direct, or even indirect, pressure on the recurrent nerves interferes with nerve conduction and immediately changes the voice. The naked recurrent nerve is almost as sensitive as the naked brain, or the spinal cord. If the nerve is merely pinched, there will be complete restoration of function in from thirty to sixty days. Ligation or section of the nerve spells permanent paralysis. Crile believes that the most common direct cause of abductor paralysis is due to the pull on the nerve which may occur when the goitre is rolled out. Oedema following thyroidectomy undoubtedly is frequently the cause of temporary post-operative paralysis. Hoarseness and paralysis coming on twelve hours or more after thyroidectomy can best be explained by oedema of the tissues. Injury to both nerves is associated with early obstructive dyspnoea and complete loss of voice. The cords will be seen to lie half-way between adduction and abduction, thereby narrowing the breathing space. Soon the cords occupy the mid-line position, further narrowing the breathing space; dyspnoea grows progressively worse and tracheotomy may become necessary. Phonation may return in three to six months, but obstructive dyspnoea becomes prominent. Rankin is quoted as stating that 1 per cent of patients have unilateral paralysis of the vocal cords prior to operation. [It is always wise to have a laryngeal examination made before operation is undertaken.—W. I. de C. W.]

Injury to the recurrent laryngeal nerve may be avoided: (1) By adequate exposure at the time of operation. (2) By 'gentleness' in bringing the superior thyroid vessels into view. (3) Resection of the thyroid gland should always begin at its tracheal attachments and progress laterally and downward. (4) The posteromesial portion of each lobe must be preserved, and under no circumstances must the lateral wall of the trachea be exposed. (5) The anaesthetic is of extreme importance and must be light enough so that the patient can be awake within a few minutes. Ether or chloroform should never be used. Probably the best procedure combines the use of novocain infiltration with either nitrous oxide or ethylene. (6) One lobe at a time should be removed, and while the operator is working in the region of the recurrent laryngeal nerve, the patient should be awake and made to talk. (7) Accurate haemostasis is of extreme importance in thyroid surgery. No patient should be permitted to leave the operating table until the operator is satisfied that he has done everything to prevent a post-operative haemorrhage. Every patient should be made to cough or strain in order to demonstrate any overlooked open vessels. (8) Grabbing of tissue about bleeding points should be avoided. Single bleeding points must be isolated before a haemostat is applied. (9) Rough sponging or pulling should be avoided, thus preventing excessive post-operative oedema. (10) Hematomata should be recognized and evacuated early. (11) Routine pre-operative laryngoscopic examination of the vocal cords is advisable, as one

cord may be impaired. Such information is of importance to the surgeon, who will be particularly careful to preserve the remaining nerve.

A. S. Jackson<sup>1</sup> performs thyroidectomy with the *radio-knife*. He says: (1) Careful consideration of the advantages and disadvantages of the radio-knife in thyroid surgery after a year's experience has convinced him that the advantages considerably outweigh the disadvantages and that he will continue to use it routinely. (2) Experience will tend to diminish the number of complications that might occur through its use. In his series of 160 thyroidectomies there were 3 cases of post-operative hæmorrhage, all of which were controlled successfully. (3) It is possible that the severity of the post-operative reaction in hyperthyroid cases is lessened. The results in his group of cases did not warrant these conclusions. (4) Sufficient time has not elapsed to ascertain the effect of the radio-knife on the prevention of recurrence following thyroidectomy. Because more tissue can be removed or destroyed with a greater degree of safety than with the scalpel, the incidence of recurrence will be decreased. (5) The radio-knife permits the surgeon to perform a smooth, speedy, comparatively dry thyroidectomy, thus increasing the patient's chances of recovery.

**Intrathoracic Goitre.**—It is wise to examine every case of goitre for intrathoracic projection before operation is undertaken. Although an intrathoracic lobe usually manifests itself from the history of the patient and the nature of her symptoms, yet it may be present when least expected. It is the practice of the reviewer to have an X-ray photograph taken in all goitre cases.

G. M. Curtis<sup>5</sup> states that the diagnosis of intrathoracic goitre is readily made by X rays. The clinical symptoms and signs of importance are dyspnoea, choking and strangling attacks, and laryngeal and tracheal deviation. Intrathoracic goitre should be considered in cases of obscure asthmatic conditions. A number of these goitres become toxic or may grow, and become acutely enlarged and inflamed from hæmorrhage; cysts or carcinoma sometimes develop. Calcification is frequent. The operative mortality is very low. Intrathoracic goitre maintains its blood-supply from above, and it usually dislocates easily from the thorax into the operation area in the neck. Occasionally, removal of the goitre piecemeal or resection of a portion of the sternum becomes necessary. Intrathoracic goitres do not respond well to irradiation. After removal the trachea returns to its normal position in about ten days.

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## GONORRHOEA.

Col. L. W. Harrison, D.S.O.

**Causes of Continued High Incidence.**—L. W. Harrison,<sup>1</sup> in a paper on the epidemiology of venereal diseases, did not find that the measures adopted in most civilized countries of the world to combat the spread of venereal diseases had resulted in a material reduction in the incidence of gonorrhœa. In Germany, as a result of the census in 1927, Dornedden had claimed a reduction of about one-third in that country, but the reasons for this view did not appear very convincing, and in England and Wales, judging by the returns from the treatment centres, the incidence appeared as high as ever. J. Jadassohn<sup>2</sup> attributes the slower progress in the campaign against gonorrhœa to: (1) The absence of a chemotherapeutic specific; (2) Greater difficulty in discovering the source of infection; and (3) Difficulty in determining non-infectivity. Harrison<sup>1</sup> believes that the cause lies in the amount of gonorrhœa in women which never comes under treatment. The statistics of most of the countries reviewed showed that, while the ratio of females to males brought

under treatment for fresh syphilis ranged in the different countries from 1 to 1.1 to 1 to 1.8, the similar ratio in the case of gonorrhœa was less than half this, ranging from 1 to 2.6 to 1 to 4.4. It is well-known that much more syphilis is concealed or ignored by women than by men, but these figures seem to indicate that this evil of concealment is far greater in the case of gonorrhœa. Until this is remedied it is unlikely that much progress will be made against gonorrhœa. When a way has been discovered of persuading women to seek expert advice for slight abnormal discharges, and when the diagnosis of the conditions underlying such discharges by mere naked-eye inspection is classed as malpraxis, we shall have made the first step towards reducing the incidence of gonorrhœa, because by suitable daily treatment of women with gonorrhœa it is quite practicable to make the vaginal contents innocuous, thereby breaking the chain of infection quickly.

**Sero-diagnosis.**—Current literature shows evidence of the steadily growing use of the complement-fixation test in gonorrhœa. A matter of great importance in determining the question of cure is the length of time after eradication of the disease that the serum reaction persists. I. N. O. Price<sup>3</sup> followed up fifty uncomplicated cases until the positive reactions given by all their sera had reverted to negative. The results are shown in the following table.

RELATIONSHIP BETWEEN CLINICAL CONDITION AND SERUM REACTIONS OF 50 CASES OF UNCOMPLICATED GONORRHOEA.

MONTH AFTER INFECTION	CLINICALLY CURED	SERUM REACTIONS		
		Negative	Doubtful	Positive
1st .. ..	0	0	0	50
2nd .. ..	13	7	5	38
3rd .. ..	29	20	2	28
6th .. ..	50	50	0	0

If investigation by other workers confirms the inference from these results that the serum reaction reverts to negative within a few months following eradication of the disease, it will add very greatly to the value of the serum reaction in judging the question of cure. G. Hopf<sup>4</sup> thinks it important to watch the titre of the complement-fixation reaction throughout the course of an attack of gonorrhœa. He records five cases in which a feeble or negative reaction preceded the appearance of a complication, and in some cases a recrudescence of arthritis coincided with a fall in the titre of the reaction. He thinks that, if no complication follows a fall in the titre of the reaction, it indicates recovery. On the other hand, a persistently high titre strongly suggests persistence of the infection. R. Foerster<sup>5</sup> concludes that a strongly positive reaction eight or ten weeks after apparent recovery should always arouse a suspicion of a persistent focus. On the other hand, when the reaction gradually becomes negative some time after completion of treatment, this is one, if not the only, indication of complete recovery.

In an article referred to in more detail below, P. Mulzer and E. Keining<sup>6</sup> mention that one result of a form of therapy by artificial production of high fever which they have investigated is that, coincidentally with a successful clinical result, the titre of the complement-fixation reaction has been found by Hopf to have risen to an extraordinary height, a serum dilution of 1-1000 regularly sufficing to bring about complete fixation. This recalls a similar finding by D. Thomson<sup>7</sup> working with detoxicated gonococcal vaccine, and

seems to show that the test is of value both in prognosis and as a guide to the efficacy of therapeutic measures.

In *children with vulvo-vaginitis* the opinions on the value of the complement-fixation test have varied, but A. Cohn and F. Rosowsky,<sup>8</sup> on the strength of 106 tests of 64 cases of gonorrhoea of children and of 18 controls, conclude that it is specific and valuable in diagnosis. It is interesting that in five of their cases the previously strong reactions became negative in two to three and a half months after clinical cure. Price<sup>3</sup> investigated 47 cases of vulvo-vaginitis in children, gonococci having been found in 42. In the 42 were 29 with positive reactions, 7 with weakly positive, and 6 with negative; all the 6 were clinically cured at the time of the test. The 5 in which gonococci had not been found gave negative reactions.

**Complications.**—A case of *gonococcal stomatitis* is reported by A. D. Fraser and J. Menton.<sup>9</sup> The infection appears to have been conveyed by the patient's fingers, and the buccal mucous membrane, anterior half of the tongue, gums, and tonsils became coated with a greyish adherent membrane, removal of which revealed bright red areas with numerous bleeding spots. The diagnosis was fully confirmed by cultural and other tests. The authors have found only forty cases in the literature. In these the mouth showed sharply localized whitish patches with reddish zones. The condition yielded easily to a mouth-wash of **Potassium Permanganate**.

Three cases of *subcutaneous and subfascial suppuration* due to the gonococcus are reported by O. S. Randall and T. G. Orr.<sup>10</sup> In the first the abscess started after a slight injury just below the great trochanter and tracked down below the deep fascia until six months later there was a sinus just above the left knee. The infection persisted for over a year, during which the temperature was sometimes 101° F. or 102° F., and the patient nearly died of cardiac collapse. In the second case an abscess formed on the dorsum of the left index finger near the base. After this a large abscess formed on the ulnar side of the wrist; neither abscess appeared to be connected with a tendon-sheath. In the third case the abscess formed in the subcutaneous tissue of the right buttock. In all three cases the only organisms isolated were identical with the gonococcus, and there was a coincident gonococcal urethritis.

A case of *gonococcal pyonephrosis* is reported by M. F. Nicholls.<sup>11</sup> The author mentions that in 1922 Simmons had found only 24 proved cases of gonococcal infection of the kidney, and in only 15 of these was the infection pure, the other organisms in 9 being chiefly *B. coli*. The genital infection in the author's case was confined to the urethra, and its gonococcal nature does not appear to have been obvious at first, when cultures were sterile. The next event, a week later, was arthritis of one elbow, and then gonococci were found in the urethra. Two and six days after commencement of the arthritis rigors occurred, and two days later a swelling in the left hypochondrium directed attention to the kidney condition. The author thinks that, like other cases recorded in the literature, the kidney infection was haematogenous. He comments on the slightness of the primary gonococcal lesion. [In this connection it is interesting that in a few cases of very severe gonococcal arthritis in women treated at the St. Thomas's Hospital V.D. Department the signs of inflammation in the genito-urinary passages have been slight or even altogether absent, though gonococci have been found abundantly in smears and cultures of the secretions. It seems to suggest that a violent inflammatory reaction at the site of inoculation may confer some protection on other structures. Also it seems probable that the average female's mucous membrane does not react so violently to the gonococcus as does the average male's. Often enough also in men with metastatic complications the genito-urinary signs have been

so slight as to have passed unnoticed by the patient, though the disparity between the local signs and the severity of the complication has not appeared so striking as it can be in women.—L. W. H.]

A case of *gonococcal polyarthritides* in a new-born infant is reported by A. D. C. Bell and P. A. Clements.<sup>12</sup> The infant developed ophthalmia neonatorum at the age of four days, and the arthritis, eventually affecting two finger-joints, an ankle, and a metatarso-phalangeal joint, commenced on the eighth day. Gonococci were found in the fluid from one joint. At the same time the conjunctivitis subsided but returned slightly sixteen days later, and gonococci were found in the secretions; they persisted then for fourteen days in spite of treatment, the conjunctivitis remaining very slight the whole time. Recovery from the arthritis was complete in approximately five weeks, the treatment having been simply protection without splinting. In the literature the authors had been able to find only forty-three cases of gonococcal arthritis in infants.

*Prostatitis and seminal vesiculitis* are commonly attributed to the gonococcus, but are due to other organisms in a far higher proportion of cases than is generally recognized. E. Wohlstein,<sup>13</sup> in a critical review on the literature of prostatitis, quotes from a large number of articles examples of infection by a great variety of pathogenic organisms. In the majority the infection reaches the prostate from the urethra, but in an important proportion it is hæmatogenous. Amongst these may be mentioned especially prostatitis following or accompanying influenza, mumps, pneumonia, typhoid fever, tonsillitis, pyorrhæa, and tuberculosis; it seems probable also that *B. coli* not uncommonly reaches the prostate directly through the blood-stream. O. J. Wilhelmi,<sup>14</sup> in an analysis of 500 cases of chronic prostatitis, found that 27.5 per cent were non-venereal in origin. The commonest micro-organisms found in these cases were staphylococci, and in the list of primary foci tonsillitis was followed in order of frequency by sinusitis, furunculosis, abscess of teeth, influenza, conjunctivitis, and mastoiditis.

#### TREATMENT.

The administration of **Acridine Dyes**, either intravenously or by mouth, is favoured by a number of workers in spite of the fact that, as shown by D. H. Murray (see MEDICAL ANNUAL, 1931, p. 224) and others, in a proportion of cases they damage the liver. W. Engelhardt and K. Gemmer<sup>15</sup> have shown that the internal administration of such dye-stuffs as **Trypaflavine**, only inhibits the growth of gonococci in the genital tract. They found also that intravenous injection of acridine dyes in conjunction with local treatment by the same was ineffective. They then treated fifty cases by intravenous injection of trypaflavine in conjunction with the local use of silver compounds and sometimes potassium permanganate. They concluded that, while the duration of the disease was not shorter than in cases treated only by local medication, the intravenous treatment tended to prevent backward extension of the disease and reduced to a minimum the risk of complication or relapse. [My own experience with **Pyridium** in conjunction with local treatment on ordinary lines is that it does not reduce the duration of the attack, though it may prevent extension to the posterior urethra. It certainly does not kill gonococci, for I have frequently cultivated these organisms from urine of gonorrhœa patients under treatment with double the recommended doses.—L. W. H.]

R. Polland<sup>16</sup> recommends local treatment with **Transargan**, a white crystalline salt containing 32 per cent of silver. He claims that in a concentration of  $\frac{1}{4}$  to 1 per cent it is non-irritating, and it has the great advantage that it does not stain; also its solution is stable. He recommends for ordinary use

a 0.2 to 0.6 per cent solution in 0.2 per cent sodium bicarbonate injected four to six times a day and retained for five minutes.

E. Langer<sup>17</sup> considers that the silver preparation, **Targesin**, introduced by Siebert and Cohn (*see* MEDICAL ANNUAL, 1927, p. 205) is the best medicament for local treatment of gonorrhœa in either sex. In a strength of  $\frac{1}{2}$  to 3 per cent it is non-irritating. Its silver content makes it gonococcicidal, and its tannin-ester component gives it an astringent effect which makes for reduction of the inflammation. The injections by the patient can be supplemented by Janet irrigation, and the preparation has the merit that it can be retained in the bladder for long periods. The author has found the targesin-tragacanth mixture recommended by Schlenzka particularly valuable in the treatment of male urethritis, in gonorrhœa of females, and in gonorrhœal proctitis. In the last, after washing out the rectum, a 5 to 10 per cent solution in tragacanth emulsion is injected and retained for many hours, preferably over-night. If the emulsion is impracticable, he prescribes 10 per cent targesin suppositories to be inserted two to three times a day, always after preliminary irrigation of the canal.

In 1927 R. D. Herrold and H. Culver recommended the application of antiseptics to the urethra in a **Gelatin Medium** (*see* MEDICAL ANNUAL, 1929, p. 203); the recommended strength of the gelatin is 10 to 15 per cent and it is kept warm in a vacuum flask. In a recently published reply to a correspondent<sup>18</sup> they state they have now used the method for four years and are still satisfied with it. They have, however, reduced the strength of the acriflavine to half that formerly recommended (1-400). They mention that they have had personal communications from several urologists commending the principle of incorporating the chosen antiseptic in a gelatin medium.

C. Bruck<sup>19</sup> says that in the treatment of gonorrhœa in males we seem to have reached a stage of more or less stagnation where for local treatment the silver salts hold the first place. It has gradually become recognized that the best results are achieved not by using the strongest possible concentration but the weakest which will kill the gonococci, and in doing so exercise the least irritating effect on the mucous membrane. The old Neisser-Jadassohn principle holds good that the object in local treatment is not to secure a 'sterilisatio magna', but a quite gradual but continuous change of the mucous membrane in the direction of making it an unfavourable medium for the gonococcus without at the same time interfering with its recuperative powers. The author recommends injections of a **Silver Preparation** three or four times a day, preferably preceded by an irrigation with quite weak **Potassium Permanganate** (1-30,000) solution, or with plain water; for the purpose of the irrigation he has devised a special syringe (sold by Medizinisches Warenhaus, Berlin, N.W.6). This, however, still leaves the urethral mucosa unmedicated during the hours of sleep, when the gonococcus has an opportunity of spreading. Many medicated bougies have been devised to avoid this, but they have material disadvantages. These, he thinks, have been overcome in the special bougies of **Hegonon** made by Schering-Kahlbaum ('Hegononstäbchen Masculin') which gradually give off their hegonon to the urethra whilst acting also as a drain.

**Pyrogenetic Treatment.**—Numerous successes have been reported in the treatment of chronic and complicated gonorrhœa with **Malaria**. This, however has the obvious disadvantage that it is safe only in otherwise healthy patients and is debilitating. As substitutes for malaria, numerous other fever-producing agents have been recommended. P. Mulzer and E. Keining,<sup>6</sup> after careful study of the effects of malaria and other agents, strongly recommend intravenous injections of **Gonoyatren** (Behring), the type used being

'Gonoyatren extrastark', which is sold by the Bayer combine in bottles of 50 c.c. containing 500 millions per cubic centimetre. The dosage for an average adult was designed to produce three to five rises of temperature (to at least 103° F.) each day, followed by seven or eight similar rises every other day. This was found better than the tertian type of fever throughout, or a longer spacing out of the paroxysms. The successive doses in cubic centimetres were 0.3, 0.5,  $2 \times 1.0$ ,  $2 \times 2.0$ ,  $2 \times 4.0$ ,  $2 \times 8.0$ , and, exceptionally, 16.0. The method was found to be useless in ordinary gonorrhœa of the mucous membrane, but the authors found it very valuable in such affections as littritis, cervical gonorrhœa, and all complications. The authors emphasize that only maximal fever works well, and warn against the use of smaller doses. They say it is astonishing what an enormous dose of the vaccine the body will stand. The effect of the treatment in raising the titre of the complement-fixation reaction has been mentioned above.

R. Foerster<sup>20</sup> substantially confirms these findings. He has used **Arthigon** and **Diagon** instead of gonoyatren, starting with 50 to 100 millions and increasing to 300 or 400 millions. He recommends the use of maximal vaccine fever therapy in all stubborn and complicated cases. If it fails, he would use **Pyrifer**, which, however, has more uncomfortable side-effects, such as vomiting, severe body and joint pains, etc. Pyrifer is a suspension of non-pathogenic organisms sold in strengths varying from 50 to 5000 millions per cubic centimetre. It has been used by numerous workers as a substitute for malaria in the treatment of general paresis and by Janson and others in the fever treatment of gonorrhœa. If pyrifer does not succeed and there is no contra-indication on the score of heart or other visceral disease, Foerster would resort to malaria. In any case the number of paroxysms should be not less than ten, and the treatment should be supplemented by local medication.

In the discussions on gonorrhœa at the Sixteenth Congress of the German Dermatological Society<sup>21</sup> Z. Zeiler (Wurzburg) and W. Scholtz (Königsberg) spoke well of pyrifer, but Reicke preferred arthigon as a fever-producing agent, saying that pyrifer had disappointed him. Nägele (Rostock) and Werther (Dresden) had obtained good results with malaria. [It is noteworthy that Foerster and also Mulzer and Keining, like others, do not appear to think that measures which raise the immunity have much effect on the purely mucous membrane affection. But undoubtedly the progress of this is affected by the patient's resistance; otherwise it is difficult to explain why in some patients the disease clears up in a comparatively few days though in others, without complications, it may persist for many weeks or even months. Also it must have been noted by many workers in this branch that often a patient who has been treated for many weeks by purely general measures and has continued to show a profuse discharge has cleared up after a few irrigations. The most likely explanation seems to be that the interaction between germ and tissue has produced a local if not a general immunity of a degree insufficient alone to bring about eradication of the disease, but now completely effective when assisted by such mild local medication as is contained in irrigation with a weak solution of potassium permanganate. It seems possible that this neutralizes a toxin against which the mucous membrane has been unable to elaborate a sufficient resistance. In this connection it may be interesting to recall the observation of C. White and H. Winter (*see* MEDICAL ANNUAL, 1931, p. 224) that the intra-urethral injection of autolysed gonococci was a strong provocative of relapse in uncured cases.—L. W. H.]

C. Rieger<sup>22</sup> has tested clinically a new **Vaccine** made by the Vienna Sero-therapeutic Institute in which the gonococci has been killed with formalin. Balcher Kraus and Lowenstein,<sup>23</sup> on the toxoid of tetanus bacilli, and Pfeiffer



and Lubynsky,<sup>24</sup> on the effect of formalin on endotoxin, have shown that killing with formalin leaves the antigenic properties less disturbed than do other methods. Rieger's impression is that the new vaccine is an advance on others. Rieon<sup>25</sup> reports brilliant results in cases of *gonococcal arthritis* from the injection of vaccine into the tissues at the port of entry of the gonococcus. Thus, in a male 0.25 c.c. of gonococcal vaccine of the Pasteur Institute was injected into the mucocutaneous junction of the meatus and was followed by 8 injections of 0.5 c.c. at two- to three-day intervals. In a female 6 injections of 0.25 to 0.5 c.c. were made into the posterior lip of the cervix every two days.

J. S. Diasio<sup>26</sup> reports well on intradermal injections of *Aolan* in *gonococcal salpingitis*. The dose is 1 c.c. distributed in three wheals on the extensor surface of the forearm. Six injections at intervals of twenty-four hours constitute a course, and several days elapse between one course and the next. No injection is given during menstruation or for two days after. The treatment was well tolerated except in three cases (out of 101), in which slight symptoms of shock appeared.

It is commonly stated that *gonorrhœal vaginitis* does not occur in women with normal menstruation. N. Z. Ivanov<sup>27</sup> contests this view. In biopsies of over 200 cases of acute and chronic gonorrhœa he found almost invariably gonococci lying deeply within the epithelial tissues.

For the treatment of *gonorrhœa in the female child* H. G. Broadbridge<sup>28</sup> recommends some special cannulæ made for him by Montague. The urethral cannula is probe-pointed at one end and is connected through the medium of 8 in. of narrow rubber tubing with either an irrigator or a 2-c.c. Record syringe, according to whether one is irrigating or applying paints such as silver nitrate solution to the canal. Two varieties of vaginal cannula are used, one with a spray nozzle for douching, and the other with a wide aperture for the introduction of viscid materials, e.g., 2 per cent flavine in glycerin; the latter cannula is used with a 10-c.c. syringe.

A. von Wahl<sup>29</sup> advocates prolonged injections of silver compounds in the treatment of gonorrhœa of females, both children and adults. He considers this much better than ordinary irrigation, and has designed a special syringe of 100-c.c. capacity which permits of the silver solution being retained for anything from five to thirty minutes. He uses 0.05 to 0.02 per cent *Albargin*, or 0.025 to 0.1 per cent *Ichthargan*. The injections should be carried out three times a day and should not be suspended during menstruation. The author states that the treatment usually lasts from four to six weeks.

REFERENCES. <sup>1</sup>*Proc. Roy. Soc. Med.* 1931, June, 35; <sup>2</sup>*Med. Klin.* 1931, April 24, 609; <sup>3</sup>*Brit. Med. Jour.* 1931, i, 578; <sup>4</sup>*Med. Klin.* 1931, xxvii, 1066; <sup>5</sup>*Münch. med. Woch.* 1930, Oct. 30, 1877; <sup>6</sup>*Deut. med. Woch.* 1931, March 20, 481; <sup>7</sup>L. W. Harrison's *A Sketch of Army Medical Experience of Venereal Disease during the European War 1914-1918*; <sup>8</sup>*Deut. med. Woch.* 1931, Sept. 4, 1540; <sup>9</sup>*Brit. Med. Jour.* 1931, i, 1020; <sup>10</sup>*Amer. Jour. Surg.* 1931, April, 117; <sup>11</sup>*Lancet*, 1931, ii, 130; <sup>12</sup>*Ibid.* i, 1349; <sup>13</sup>*Arch. f. Dermatol. u. Syph.* 1930, May 27, 267; <sup>14</sup>*Jour. Amer. Med. Assoc.* 1931, July 11, 131; <sup>15</sup>*Dermatol. Woch.* 1930, xci, 1782; <sup>16</sup>*Münch. med. Woch.* 1930, June 20, 1059; <sup>17</sup>*Ibid.* 1931, April 10, 614; <sup>18</sup>*Jour. Amer. Med. Assoc.* 1931, May 2, 1531; <sup>19</sup>*Deut. med. Woch.* 1931, Jan. 2, 15; <sup>20</sup>*Münch. med. Woch.* 1931, Jan. 6, 945; <sup>21</sup>*Arch. f. Dermatol. u. Syph.* 1930, May 27; <sup>22</sup>*Wien. klin. Woch.* 1930, Aug. 28, 1082; <sup>23</sup>*Zeits. f. Immunol.* xlii, 350; xlv, 86, ref. Rieger; <sup>24</sup>*Zentralb. f. Bakteriol.* 1927, cii, 459, ref. Rieger; <sup>25</sup>*Bull. Soc. méd. chir. Indochine*, 1931, ix, 65; <sup>26</sup>*Med. Jour. and Record*, 1931, March 18, 291; <sup>27</sup>*Gynéc. et Obstét.* Paris, 1931, Feb., 128, ref. Jour. Amer. Med. Assoc. 1931, May 30, 1916; <sup>28</sup>*Lancet*, 1930, ii, 580; <sup>29</sup>*Arch. f. Dermatol. u. Syph.* 1930, May 27, 248.

**GRANULOMA INGUINALE.** (See CHANCROID.)

**GRAVES' DISEASE.** (See HYPERTHYROIDISM.)

**HÆMOLYTIC ICTERUS.** (See JAUNDICE, ACCHOLURIC.)**HÆMORRHOIDS.**

J. P. Lockhart-Mummery, F.R.C.S.

D. Warshaw<sup>1</sup> deals with the removal of piles by **Diathermy**. The patient is anæsthetized by sacral infiltration (sacral anæsthesia), and after the perineum has become anæsthetized, the pile masses are dragged down with forceps and the whole mass clamped in a large hæmorrhoidal clamp. After removal of the forceps the mass protruding from the clamp is well cooked with a diathermy needle. A monopolar current is used capable of giving a steady  $\frac{1}{4}$ -in. spark. The charred mass is then cut off and the stump between the clamps is similarly treated before removal of the clamp. It is claimed for this method of operation that there is no loss of blood, healing is quick, and complications are lessened.

J. P. Lockhart-Mummery<sup>2</sup> discusses the treatment of internal piles. He says the **Injection Treatment** is very suitable in the following cases: (1) In old people; (2) In patients with some other disease which contra-indicates operation; (3) In pregnant women; and (4) In very busy people who are quite unable to spare the necessary time to undergo an operation and who wish to be relieved for the time being with a minimum of inconvenience. It is unsuitable in: (1) Young persons; (2) Where the piles are very large and prolapse very easily; (3) When one or more of the piles cannot be made to stay up in the rectum when replaced; (4) When there are complicating conditions, such as fissure, fistula, and polypi. Patients should always be warned that a recurrence necessitating further treatment will probably occur in the course of two or three years. Diathermy ionization and high-frequency electric currents cannot be considered as satisfactory for the treatment of piles.

There is probably no surgical operation which gives such uniformly good results as that for the removal of piles when properly performed. The proportion of recurrences is only about 1 per 1000, and if the operation is performed under modern aseptic methods in the right manner, the amount of pain and discomfort is negligible and not more than after an operation on varix of the leg, or hernia. The writer favours a ligature operation performed under local, spinal, or avertin anæsthesia.

REFERENCES.—<sup>1</sup>*Amer. Jour. Surg.* 1931, Jan., 45; <sup>2</sup>*Practitioner*, 1931, May, 495.

**HAND AND ARM, INFECTIONS OF.** (See also FINGERS, INJURIES OF.)

Sir W. I. de C. Wheeler, F.R.C.S.I.

S. J. H. Griffiths<sup>1</sup> refers to the devastating results of suppuration occurring about the fingers, loosely called *whillow*. The suppuration may be in the

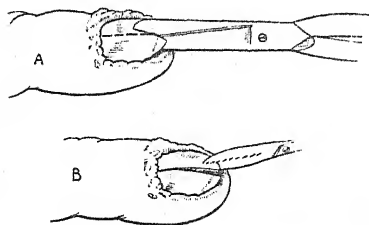


Fig. 43.

(Figs. 43-46 re-drawn from 'The Practitioner'.)

pulp of the distal phalanx, leading rapidly to necrosis. The pulp should be freely and early incised by lateral incisions (Fig. 45, A). The infection may be at the base of the nail-bed, starting on one side and spreading rapidly to the other. It may be acute or chronic. In acute cases the nail floats on a bed of pus necessitating the removal of the nail. In removing the nail, a stout pair of scissors is thrust down the middle and the nail divided into halves. Each half should then be evulsed towards the centre

(Fig. 43). By this method the nail-bed is not damaged. After removal of the nail, lateral incisions may be made (Fig. 46, C). In chronic cases seen in

neurotic females the best treatment is painting with **Silver Nitrate**, 5 gr. to the ounce.

*Sub-cuticular Whitlow.*—This is merely a purulent bleb, which should be cut away with sharp scissors.

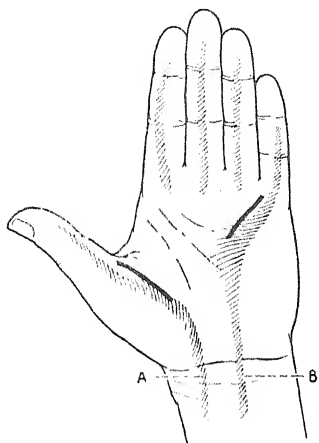


Fig. 44.

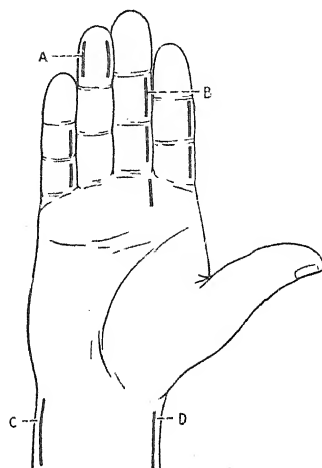


Fig. 45.

**Tenosynovitis.**—This is suppuration in the tendon-sheaths. The flexor tendons are far more commonly infected than the extensors. The flexor tendons of the middle three fingers have sheaths extending to the front of the knuckles, but the sheath of the little finger extends into the large sheath in the hand, which in turn extends under the annular ligament and is known as the ulnar bursa (Fig. 44, B). That of the thumb extends in like manner above the wrist as the radial bursa (Fig. 44, A), and these two bursae frequently communicate. Suppuration is brought about : (1) By direct infection ; (2) By direct extension of the subcuticular infection ; or (3) By the blind opening of the subcuticular infection, the point of the knife being carried into the tendon-sheath. Very quickly there is produced constitutional disturbance, exquisite local tenderness, and great pain on passive extension of the affected digit. The infection rapidly spreads in the case of the thumb to the radial and in the case of the little finger to the ulnar bursa. In the case of the middle three fingers, the infection spreads into one of the fascial spaces in the palm. Of these there are two, the thenar space and the middle palmar space. The communicate with the tendon-sheaths. Tendon-sheath infection should be opened over the point of maximum tenderness and swelling, and by lateral incisions on the palmar surface of the finger between the joints (Fig. 45, B).

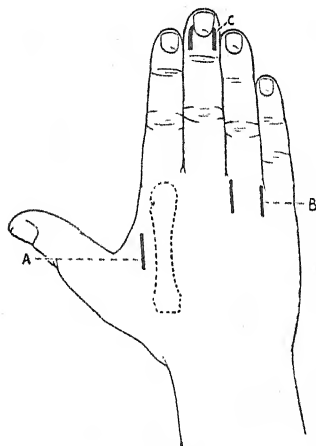


Fig. 46.

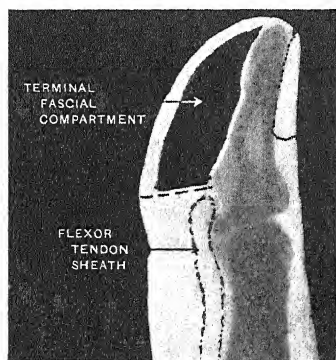
The ulnar and radial bursæ should be opened by incisions through the palm in the manner shown by the accompanying diagram (*Fig. 44*).

**Thenar Space Abscess.**—Here, in the words of Kanavel, there is a ballooning of the thenar eminence, and the thickness of the thumb between the palm and the dorsum is greatly increased. The sign is indicative of thenar space infection and calls for drainage of the pus. This can be done by an incision on the dorsum of the hand on the radial side of the index metacarpal and the pus reached by Hilton's method (*Fig. 46, A*).

**Middle Palmar Space.**—There is swelling of the whole hand, and the space should be opened on the dorsum by incisions in the third and fourth clefts (*Fig. 46, B*), or via a lumbrical canal (*see Figs. 49, 50*). If the infection spreads into the forearm, then lateral incisions should be made deep to the profundus tendons (*Fig. 45, C and D*).

**Lymphangitis.**—This is usually streptococcal and starts from a minute wound, around which a bright reddish blush occurs. This is rapidly followed by a pitting œdema. If occurring in the finger, it rapidly spreads up the arm first by red streaks. The glands become painfully enlarged. The affected finger can be moved without pain, and in the region of the wound there is no special tenderness. The condition may terminate in one of three following ways: (1) Localized fugitive process; (2) A rapid extension to the deep planes; (3) A rapidly fatal septicæmia.

**TREATMENT.**—Hasty incisions should not be made, but attention paid to the general condition, the giving of whole arm baths, and the production of passive hyperæmia. We hope that the infection will be arrested in the case of the little finger by the epicondylar glands, and in the case of the other fingers by the apical and the glands of the axilla. As soon as there is any sign of infection of the glands, there should be free fomenting and pus formation watched for, but often the infection is so acute that there is little if any involvement of the glands, and the infection is passed on rapidly to the general circulation, producing septicæmia. It is this condition where the **Anti-streptococcal**



*Fig. 47.*—The terminal fascial compartment in the pulp of a finger or thumb.

(*Figs. 47-50 by kind permission from Hamilton Bailey's 'Emergency Surgery'.*)

**Serum Globulins of Scarlet Fever** produce such dramatic results. In severe cases, about 30 c.c. should be given intravenously. This serum is very potent and the reaction, unless care is taken, may be amazingly severe. When giving it intravenously it is advisable to dilute it with normal saline, about 1-3, but sufficient serum must be injected to produce a reaction. If the case is not very severe, then 20 c.c. may be given intramuscularly and repeated the following day if no improvement. It is surprising how quickly an indolent septic finger will heal when the part is placed entirely at rest, either with the patient in bed or the whole arm on a flat splint and kept in a sling.

Hamilton Bailey<sup>2</sup> deals very fully with infections of the hand. The first thought should be: "Is this a case of (1) Tenosynovitis; (2) Palmar-space infection; or (3) Lymphangitis?" Tenosynovitis and palmar space infections call for immediate operation. Primary lymphangitis should not be treated by operation in the early stages. It is pointed out that too often the back of the hand is

incised when pus lies in the palm. Edema of the dorsum, which is often present in infections of the hand, gives rise to a swelling which pits on pressure. If the swollen back of the hand pits on pressure, it is safe to assume that pus is not present there.

Fig. 47 shows the limits of the terminal fascial compartment in the pulp of a finger or thumb. This compartment extends from the tip of the digit to the level of the epiphysial line of the terminal phalanx, i.e., a quarter of an inch distal to the last interphalangeal crease. To relieve infections in the pulp the incision should never be made in a proximal direction farther than half an inch from the terminal flexor crease; otherwise infection may be spread into the territory of the tendon sheath. It does no harm to wait for localization of pus: when the pulp feels indurated is the time to open. Probably the best incision is the one along the top of the finger, taking the line of the convex nail margin as a guide, but lateral incisions are equally effective.

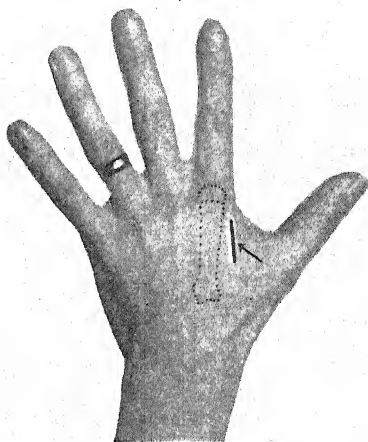


Fig. 48.—Incision for draining the thenar space.

In late cases there is nearly always osteomyelitis of the terminal phalanx and the diaphysis becomes separated by sequestrum. Full functional recovery is to be expected.

Infections of the *thenar space* result in marked swelling of the thenar eminence. The primary infection is usually in the tendon-sheath of the index finger. Operation is imperative. The

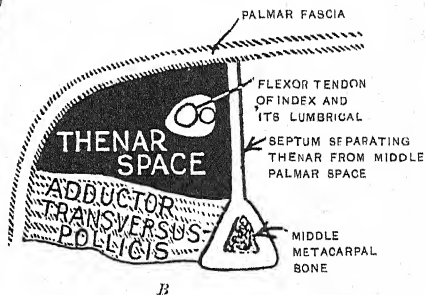
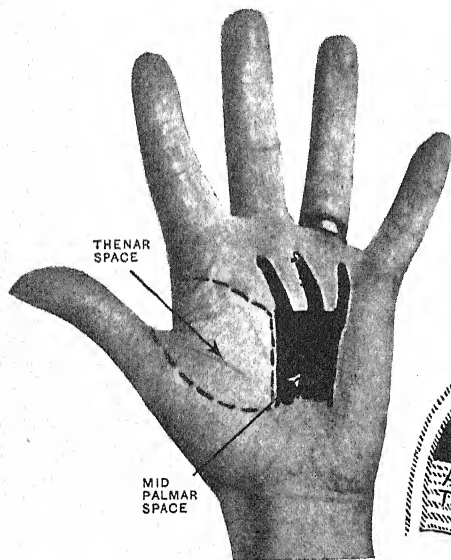
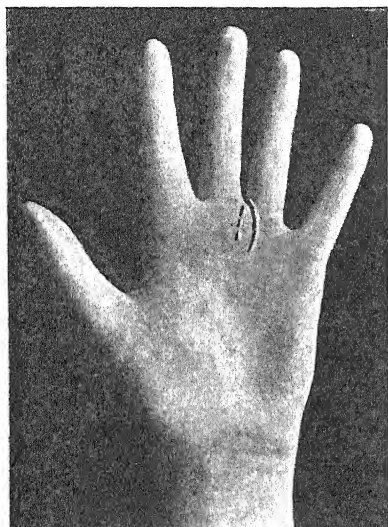


Fig. 49.—A. The relative positions of the thenar and middle palmar fascial spaces. Note the three diverticula from the middle palmar space. B. Diagram of a transverse section through the thenar space.

incision is made on the dorsum on the radial side of the second metacarpal bone (*Fig. 48*). The nose of a forceps is introduced through this incision until it reaches the palmar aspect of the metacarpal bone of the index finger. The thenar space is now entered. No tube or other drainage material is necessary.

Infections of the *middle palmar space* give rise to swelling in the palm. Obliteration of the concavity of the palm, with slight bulging, should be

regarded with grave suspicion. The convexity of the palm is never great because the resistance of the palmar fascia is so strong. There is no point of maximum tenderness. The middle palmar space has three diverticula (*Fig. 49*), which are the lumbrical canals of the middle, ring, and little fingers. Incisions should never be made on the ulnar side for the relief of middle palmar infections, as the ulnar bursa may easily be opened. Efficient drainage may be secured via a lumbrical canal. This is effected by opening up the web between the ring and middle fingers (*Fig. 50*) or the ring and little fingers. The fingers are spread. The incision begins on the dorsum and passes over the web on to the palm, but never beyond the distal flexion crease. Pressure is exerted over the middle palmar space. If pus wells up, a grooved director is inserted along the lumbrical canal. A closed haemostat is now inserted under the flexor tendon and its jaws are opened widely. No drainage



*Fig. 50.*—Incision for draining the middle palmar space. On no account drain the space directly through the palm.

material is necessary. If the suppuration is secondary to suppurative tenosynovitis of the middle or ring finger, appropriate incisions must be employed.

REFERENCES.—<sup>1</sup>*Practitioner*, 1930, Dec., 721; <sup>2</sup>*Emergency Surgery*, 1931, ii, 350  
Bristol, John Wright & Sons Ltd.

#### **HARE-LIP AND CLEFT PALATE.** *John Fraser, Ch.M., F.R.C.S.Ed.*

Victor Veau and P. Plessier<sup>1</sup> present a group of contrast cases. Eleven had been operated on by various surgeons—French, German, Venezuelan, etc.—and eight in Professor Veau's clinic, and according to his methods. No question of egotism has entered into the study; it has been undertaken to demonstrate the results of different methods. The article is copiously illustrated, and there is certainly no doubt that the results obtained by Veau's methods are remarkably good. It is obvious that there are criticisms against, and fallacies in, the contrasts afforded; it is more than likely, for example, that cases from other clinics which subsequently came under Veau's care were the failures, and it is perhaps unfair to judge too hardly by this incidence, but the method of presentation has educative values which we can readily appreciate.

The article contains no real detail of the methods practised by Veau, but, in general terms, when there is a coincident error of the lip and the palate, the lip is united at about the end of the 2nd month, and at this time the

greater portion of the hard palate is closed by a flap of mucous membrane, which is turned down from the side of the vomer. The second operation is practised at some time between the 16th and 20th months and implies the closure of the cleft in the soft palate. Veau is an opponent of wiring the alveolar projection into place, with or without an osteotomy. He holds that the pressure of the closed lip brings the projection into natural alinement.

A. D. Davis<sup>2</sup> contributes an article on the correction of cleft lip and palate, and estimates the operative failures at 70 to 80 per cent. This is surely an unduly pessimistic attitude, and it certainly is incorrect where the lip error is concerned. The author pleads for the acceptance of certain general principles. The first of these is open to serious criticism; he says: "The un-united bones (i.e., of the palate cleft) are to be approximated, contact surfaces freshened, compact bone removed, bleeding cancelled, bone placed in contact with bone, immobilized, and covered with muco-periosteum." This in fact is an expression of the Brophy creed; its fallacies have been frequently pointed out, and it may be said at once that the principle for which Davis pleads is often impossible to secure. He adds that the advantages of the Brophy type of operation are: (1) Less surgical risk, because of the undeveloped nervous system; (2) Easier closure, because of the limited ossification of the bones; and (3) Better results, because of establishing normal foundations for lip, nose, and soft tissue of the palate. "These facts being admitted", he says, "bone operations in early infancy are imperative for future results." Davis, as an advocate of the early osteoplastic palate operation, is one of a school which is well represented in the United States, but the principles have never found favour in this country, and British surgeons who have made use of the Brophy plan appear to be inclined to abandon it.

G. Gatti<sup>3</sup> describes his technique for closure of cleft palate. He says, "I defer operation for fissure of the palate until the patient is four years old; a delay until the patient is this age does no harm." The pre-operative treatment includes the spraying of the mouth and nose with a solution of 2½ per cent chlorate of potassium and hydrogen peroxide. At the time of operation the nose and mouth are disinfected with a 5 per cent tincture of iodine, the application being removed after five minutes by washing first with 70 per cent alcohol, and then with alcohol and ether. It is not clear whether the preparation is applied to the interior of the mouth and nose or to the skin surface. The method of closure is on the Langenbeck-Ferguson plan. The post-operative treatment implies isolation in a dimly-lit room, and for three days no food by the mouth is permitted. Professor Gatti says, "With this method the results have been good in all cases; there have been no deaths, and the plastic results have been good." It is interesting to compare this statement with the assertions of Davis—the one is the antithesis of the other, and yet both claim equally good results.

O. Goetze<sup>4</sup> reports a procedure which should be recorded, though it sounds fantastical, and is unlikely to meet with any measure of acceptance. If the lip error is such that there is difficulty in securing closure of the gap without tension, Goetze exposes the facial nerve and freezes it by passing underneath it a silver tube through which chlor-ethyl is sprayed. The result is a facial paralysis which persists for six to eight weeks. The author limits his suggestion to those cases in which tissue tension is likely to be extreme, as, for example, in cases which have suppurated, with destruction of tissue, following previous operations, but even with this provision the attendant disadvantages are so evident that it is unlikely to commend itself.

REFERENCES.—<sup>1</sup>*Bull. et Mém. Soc. de Chir.* 1931, June 13, 861; <sup>2</sup>*Surg. Gynecol. and Obst.* 1931, April, 875; <sup>3</sup>*Ibid.* 1930, Aug., 224; <sup>4</sup>*Zentralb. f. Chir.* 1931, April 11, 927.

**HEAD INJURIES.** (*See also* EPILEPSY, TRAUMATIC; NASAL SINUSES.)*Geoffrey Jefferson, M.S., F.R.C.S.*

Each year a heavy literary crop is reaped from the fertile subject of head injuries. Little by little the old fallacies are being recognized and destroyed, little by little modern doctrines are being promulgated and to some extent absorbed by the rising generation. The view that the fracture of the skull is itself of minor importance is widely taught in the surgical wards, but each year a new group of hospital residents forget all that they have been told and concentrate on the more showy and obvious side of these difficult cases. It may be that teachers have attempted to make the subject easier than it really is, for it must be admitted that neither accurate diagnosis nor treatment is always simple. W. Trotter,<sup>1</sup> in an admirable sentence, has expressed this idea memorably, "How often have we not felt by the bedside the difficulty of reconciling the supposed precepts of our masters with the versatility of Nature in producing symptoms that had no right to be there, or in withholding symptoms that we had every claim to expect."

The last decade has seen the more or less general adoption of methods of **Dehydration** as a routine treatment of *general cerebral contusion* (or 'concussion'). This treatment is beginning to be questioned, for it is not as certain as some have supposed that compression is the dominant feature calling for treatment. And if compression is not always present, then dehydration as a routine method of management is impeachable. R. Leriche<sup>2</sup> in particular suggests, and brings evidence to support the view, that, so far from being compressed, certain cases actually suffer from hypotension. In a series of 75 head injuries hypotension was present in 12, and these gave admirable results by the intravenous **Injection of Distilled Water** or normal saline (in order to increase intracranial pressure). Some of his cases were mistaken for compression and operated upon, when the dura was found to be quite slack and not pulsating, and the brain 'dry'. Many of these cases had, it is true, an external discharge of cerebrospinal fluid; but, lacking this, some cases in stupor, or semi-stupor with violent headache, present low pressure readings. In the latter cases Leriche postulates a sustained contraction of the cerebral vessels, including those of the choroid plexuses, as the result of the primary injury. It becomes clear that before any intravenous therapy is undertaken it is necessary to know the pressure of the cerebrospinal fluid. This pressure can be guessed at by the experienced, but the only real way of knowing is by carrying out a measurement with one of the simple manometers which are easily procurable. Routine lumbar puncture as a therapeutic step falls under the same suspicion as physiological dehydration. As a diagnostic measure it has its importance, but as a method of treatment it is dangerous; death has been known to follow its use.

These reflections are given point to by a paper by J. Browder<sup>3</sup> on dangers in the use of hypertonic solution; he mentions a fatality one hour and fifty minutes after administration of 60 c.c. of 25 per cent saline. At necropsy extensive lacerations were found beneath the frontal lobes, with a large amount of subarachnoid hemorrhage, which was probably increased by the induced shrinkage of the brain and rise in blood-pressure following the injection. Fay, on the other hand, remains an advocate of dehydration, reporting results in 48 consecutive cases, and practically all writers urge the same step. It seems probable that we are in danger of being obsessed by a new fashion, and that we may have as hard a fight to rid ourselves of this incubus as we have had with other more traditional incrustations. The writer's own view is that hypertonic solutions can most safely and beneficently be used in cases which are clearly recovering but are suffering from severe headache,



There is no record yet of a case which would otherwise certainly have died being saved by this therapy.

REFERENCES.—<sup>1</sup>*Lancet*, 1930, i, 169; <sup>2</sup>*Presse méd.* 1931, June 27, 945; <sup>3</sup>*Amer. Jour. Surg.* 1930, June, 1213.

**HEART.** (See also ANGINA PECTORIS AND CORONARY ARTERY DISEASE; ARRHYTHMIA AND ELECTROCARDIOGRAPHY; ENDOCARDITIS; HYPERTHYROIDISM, THE HEART IN; MURMURS, PRECORDIAL VENOUS; MYOCARDITIS; PERICARDITIS; PREGNANCY, THE HEART IN.)

**HEART, ARREST OF, IN SURGICAL OPERATIONS.** (See also HEART FAILURE.) *Sir W. I. de C. Wheeler, F.R.C.S.I.*

T. M. Green<sup>1</sup> refers to many successful cases of treatment by **Cardiac Massage**. The cardiac arrest in the operating-room is either primarily cardiac or secondary to vasomotor relaxation. Heart failure secondary to vasomotor relaxation may be foretold by repeated blood-pressure readings during anaesthesia and often prevented by intravenous injections of fluid. It has been shown in experiments upon dogs that rhythm may be restored to the quiescent heart after a period of five or six minutes with the animal to all intents and purposes dead, by injecting into the left common carotid artery a solution of 1-50,000 **Adrenalin** in normal saline. This fluid finds its way into the aorta and ultimately into the coronary arteries. As soon as the intracoronary pressure reaches a definite point, the cardiac rhythm is restored.

Green reports an interesting case. Heart-beats and respirations failed at the commencement of gas-oxygen anaesthesia. An intracardiac injection of 15 min. of adrenalin, 1-1000, was given and the thorax slapped and compressed over the heart without avail. An injection of 1-50,000 adrenalin in normal saline in the left common carotid artery was immediately started and 200 c.c. of this fluid allowed to run into the aorta. The heart was still quiescent; no respiratory function and no blood-pressure recorded. An incision exposing the third to the seventh costal cartilages was made. The cartilage was divided and retracted and the heart exposed. It was quiescent and distended. On the third effort at emptying, the rhythm was restored with force and regularity and a blood-pressure recorded of 140 to 190. The heart failed a second time before respiration could be restored. The chest wound was re-opened and massage begun again. The patient had good cardiac rhythm for the following three hours.

REFERENCE.—<sup>1</sup>*Ann. of Surg.* 1930, Sept., 331.

**HEART IN ATHLETES.**

*A. G. Gibson, M.D., F.R.C.P.*

C. Bramwell and R. Ellis<sup>1</sup> investigated with other cardiologists a group of 28 Marathon runners during the final stage of training for the Olympic Games. In comparison with other Olympic runners they are older, of an average age of 27; they are all of lighter build, with an average weight of 60 kilos.; their resting pulse-rate is slower, with an average of 58; and their average blood-pressure is slightly higher. As determined by X rays the hearts of these runners were found to be relatively larger than those of any other group of athletes. The authors investigated also the oxygen requirements and discuss the question of glycogen in relation to athletic tests. Their recorded glycogen values for 2 of the athletes who were examined after the race were 0.055 and 0.053. Both of them were on the verge of hypoglycaemic convulsions, and this is in agreement with the experience of athletes that feeding with large amounts of sugar is beneficial in averting the excessive depletion of glycogen. The conclusion in regard to cardiac enlargement is that while an enlarged heart

may occur during training if the subject has recently had an attack of some febrile complaint and that such enlargement is definitely abnormal, the evidence of an enlarged heart in Marathon runners, ski-runners, and others who engage in long-continued exertion is not necessarily evidence of disease but is compensatory, and is in agreement with what is found in different species of animals—namely, that those that live under conditions of continuous exertion have a higher heart weight in proportion to their body weight than animals that take no severe or continuous exercise.

REFERENCE.—<sup>1</sup>*Quart. Jour. Med.* 1931, April, 239.

### HEART DISEASE, CONGENITAL.

A. G. Gibson, M.D., F.R.C.P.

Three cases of *coarctation of the aorta* have been recorded recently in children, two by W. Sheldon<sup>1</sup> and one by W. G. Wyllie.<sup>2</sup> The two boys were aged 8 and 5 respectively, and the one girl 5 years. In the two boys the heart was not appreciably enlarged, but in the girl it was enlarged to the left, and this was confirmed by a skiagram. In all there was a marked systolic bruit, and the maximum intensity in two of these was over the inner end of the clavicle. The blood-pressures in these cases were 180 systolic and 120 diastolic; 130 systolic and 100 diastolic; and 170 systolic respectively—taken in the arm. The diagnosis of the condition rested on the other features—namely, enlarged tortuous arteries in the interscapular region and absent or minimal pulsation in the abdominal aorta and lower limits. In one case the boy appeared to be mentally backward.

REFERENCE.—<sup>1</sup>*Proc. Roy. Soc. Med.* (Sect. Child. Dis.), 1930, 992; <sup>2</sup>*Ibid.* 829.

### HEART DISEASE, DRUGS IN.

A. G. Gibson, M.D., F.R.C.P.

**Lacarnol.**—A certain number of papers have appeared dealing with the subject of a specific hormone for the heart and its value in the treatment of cardiac disease. O. J. Nielson<sup>1</sup> gives a report of an investigation of 47 patients whom he treated with lacarnol. The preparation is obtainable from Bayer-Meister Lucius, and is given first by intramuscular injection, 1 c.c., as well as 15 to 20 drops by the mouth three times a day. The treatment is continued by the mouth. Amongst the 47 cases 18 were suffering from true angina pectoris; 12 of these derived great benefit and became completely free from attacks. Its action must be looked upon so far as experimental.

**Amyl Nitrite.**—In a short paper dealing with the effects of amyl nitrite, W. A. Brans and H. A. Strauss<sup>2</sup> find that the size of the heart as determined by the X rays is reduced, whereas the size of the aorta is increased. This is so both in normal persons and those showing evidence of arteriosclerosis either with hypertension or without.

REFERENCES.—<sup>1</sup>*Ugesk. f. Læger*, 1931, March 15, 240 (abstr. in *Brit. Med. Jour.* 1931, i, 82); <sup>2</sup>*Amer. Jour. Med. Sci.* 1930, Nov., 618.

### HEART DISEASE, SYPHILITIC. (See also SYPHILIS.)

A. G. Gibson, M.D., F.R.C.P.

The Lumleian Lectures of Carey Coombs<sup>1</sup> sum up in a very excellent way our present knowledge of syphilis in relation to the heart and great vessels. The frequency of this disease from post-mortem records varies from 6 per cent of necropsies in Glasgow to 2.5 per cent in Bristol. Turnbull at the London Hospital found 60 per cent of fatal cases of syphilis showed aortic lesions. Coombs estimates that 5 per cent of cardiovascular cases fall into this class, though the figures of other authors differ and may be as high as 15 per cent. In Bristol cardiovascular syphilis is more frequent in post-mortem than in clinical records, and this is probably due to the proportion of cases which show

no clinical symptoms, and the tendency for all cases of syphilis of this nature to sudden death, and therefore to post-mortem examination. Only one case was found under 37 years of age; the main series spread from the ages of 37 to 60.

In the evolution of this disease there is a latent period of twenty to twenty-five years between the infection and the onset of cardiac symptoms. The commonest lesion is aortic aneurysm (75 per cent), followed in descending order by aortic regurgitation, ventricular failure, transient cardiac pain, and heart-block. Cardiac infarction is uncommon and forms less than 3 per cent. The symptoms are as a rule earlier than the signs, and the most common symptoms are dyspnoea on exertion and precordial pain. The sequence in the greater number of cases is dyspnoea, pain, and oedema.

In regard to the diagnosis of aortic aneurysm, the author alludes to the fact that a widened aortic shadow by the X rays is not essential to a diagnosis of cardiac syphilis. Amongst rare forms of syphilis is Ayerza's syndrome with syphilitic aortitis of the pulmonary artery, which is characterized clinically by dyspnoea, cyanosis, hæmoptysis, and later by congestive cardiac failure. Of 63 cases of aortic valvular disease, 54 had aortic regurgitation, 2 had obstruction, and 7 regurgitation with obstruction. The minimum blood-pressure, which is low in aortic regurgitation, is of importance in distinguishing the two types. An aortic regurgitant murmur when once established tends to be permanent. The author mentions the opinion of Sir Thomas Horder that aortic regurgitant murmurs may disappear. The reviewer has seen a patient with cardiac syphilis watched over several years who suffered from a transient attack of congestive failure, in whom a diastolic murmur disappeared in the course of treatment. Mitral systolic murmurs were noticed 24 times in 103 cases.

In regard to the muscular functions of the heart, auricular fibrillation occurred in 8 cases and faults of conduction in 6. Amongst the author's cases one only showed the lesion of right bundle branch block. From a discussion of the cases reported in the literature the author concludes that in an appreciable percentage of cases there is an abnormality of the electrocardiogram. In 26 cases only out of the 103 were other syphilitic lesions identified. These were mainly lesions of the nervous system. Finally, amongst clinical symptoms the importance of the examination for congenital syphilis is referred to.

In some remarks on the principles of diagnosis, prognosis, and treatment, the author lays stress on the importance of doubtful or otherwise negligible signs of cardiovascular disease in patients known to have or to have had syphilis, a point which was laid stress on by Phillips in 1897. The prognosis is not good. Of the author's cases almost 50 per cent died within four years of being first seen. The author believes in thorough antisiphilitic treatment in the absence of cardiac failure, including treatment by the **Arsenical Preparations** used with circumspection, though he believes that the most efficacious is **Potassium Iodide**, and perhaps next **Mercury**.

Siebeck<sup>2</sup>, in a short review of the various forms of syphilis of the heart and vessels, states that the earlier the antisiphilitic treatment is begun the better the results, but that in aortic syphilis the question of antisiphilitic treatment is frequently uncertain and occasionally dangerous. This is especially so in disease of the coronary arteries. The more severe the effects of syphilis, the more danger, and he agrees that cardiac failure from this cause is to be treated by the ordinary drugs for that disorder rather than by antisiphilitic remedies.

REFERENCES.—<sup>1</sup>*Lancet*, 1930, ii, 9, 16, 227, 281, 333; <sup>2</sup>*Munch. med. Woch.* 1930, Sept. 5, 1533.

**HEART FAILURE, TREATMENT OF.** *A. G. Gibson, M.D., F.R.C.P.*

A. S. Hyman<sup>1</sup> examines the present methods of reviving the heart in sudden failure, and suggests that so many drugs have been used that the result where treatment is beneficial is probably to be explained by the puncture alone and not by the drug. He records the fact that the myocardium of the normal heart in asystole becomes irritable with the onset of anoxæmia, and believes that needle puncture or mechanical stimulation restores the rhythm, the first contractions being extrasystoles, followed in favourable cases by a normal sinus rhythm. The practice has been to make injections into the ventricle, but from physiological principles he concludes that it would be better to make the puncture into the right auricle, thereby avoiding the production of ventricular fibrillation, which is one of the dangerous forms of arrhythmia. Moreover, the auricles are more sensitive to mechanical stimulation than are the ventricles. The right auricle can be reached in the adult by using a needle at least  $4\frac{1}{2}$  in. long with a slight curve, and the best gauge is No. 19. The needle should be passed through the third interspace as close to the right sternal margin as possible; the point must be directed towards the mid-line so that the curve carries the point under the sternum. In children the right auricle lies within 2 in. of the anterior surface of the sternum, but in average adults, judged by a series of cadavers, it is  $3\frac{1}{2}$  in., and in wide-chested persons  $4\frac{1}{2}$  in. The skill to make an accurate puncture is not difficult to acquire.

Certain experiments were made on four patients that had died. In one, a woman who had died of general carcinoma, there were weak and irregular contractions for about nine minutes. In the fourth case, a woman of 45 with mitral stenosis and severe decompensation was pronounced to be dead by the medical officer on duty in the hospital. Seven minutes after apparent death puncture of the right auricle caused an immediate response of the heart—rapid and irregular, suggesting auricular fibrillation. The needle was then withdrawn, and the patient began to show voluntary movements in about an hour, though semi-conscious. She was then given an intravenous injection of strophanthin and dextrose, and in another six hours was conscious and could speak. The patient lived for another eight days, and no attempt was made to resuscitate her again. Two other patients were resuscitated, one a man aged 36, who collapsed on the operating table, and a child during tonsillectomy. The article is a useful summary of the clinical knowledge of resuscitation. (*See also* HEART, ARREST OF, IN SURGICAL OPERATIONS.)

N. Kisthinos and D. M. Gomez<sup>2</sup> describe a short series of cases of cardiac insufficiency which were greatly benefited by the administration of **Sugar** after the ordinary remedies had failed. In another case a woman of 42 with an aortitis (probably syphilitic) suffered from the dyspnoea of effort and nocturnal attacks of dyspnoea. The heart was large though pressure was not unduly raised. Ouabain at first produced a betterment, but the attacks returned after fifteen days and the second course of the drug was of no benefit. She was given 80 grm. of **Syrup of Sugar** per diem with 4 units of **Insulin**. This produced a great improvement, and the patient was able to leave the hospital without symptoms. The other cases showed similar benefit from the treatment. While not wishing to say that this is a specific in cardiac failure, the authors think that with digitalis and other remedies it ought to take its place as an important aid to treatment in cardiac insufficiency, especially when there is failure of the muscle of the heart.

N. Loeper, A. Lemaire, and R. Degos<sup>3</sup> make a plea for the use of **Insulin** as a remedy in cardiac failure. Their suggestion rests on the principle that insulin assists in the fixation of glycogen in the muscle fibre which may be

diminished by cardiac disease. They inject 5 to 10 units of insulin daily for six to ten days in the morning. Higher doses appear to be useless, and after the injection 50 to 100 gm. of **Syrup of Glucose** was administered. No ill effects have been observed beyond transitory fatigue and occasional vomiting. In two cases of rheumatic mitral endocarditis with hypertension, the dyspnoea disappeared at the second injection and the hypertension became less. In a series of six cases that had had no benefit from treatment by digitalis or ouabain all showed amelioration. Arrhythmia occasionally disappeared and diuresis was marked. The action of insulin was also evident in marked cases of syphilitic aortitis after specific medication. The method appears to have possibilities in a proportion of cases showing gross cardiac failure.

H. Gould and A. C. De Graff,<sup>4</sup> as the result of studying the effects of **Digitalis** on different classes of cardiac patients, find that the amount of the drug necessary to get the full therapeutic effect is much greater in patients with acute or very advanced cardiac failure than in those with moderate cardiac failure such as the ambulatory patient with auricular fibrillation. The amount necessary to get toxic effects is the same in both degrees of failure. The therapeutic dosage in the patient confined to bed must therefore be large, for the margin between the full therapeutic effect and the stage in which toxic symptoms supervene is normal. The authors emphasize the necessity of this principle by referring to Withering's advice, "let the medicine be given until it either acts on the kidneys, the stomach, the pulse, or the bowels; let it be stopped on the first appearance of any of these effects."

In an article by W. T. Ritchie<sup>5</sup> on the treatment of circulatory failure, the writer refers to the value of continuous **Oxygen** administration as a means of combating toxic shock such as is seen in pneumonia. It is important that the gas should be given if possible by means of a mask, as the ordinary method of a funnel near the patient's mouth is of no value. Not less than 2 litres a minute should be administered in order to obtain results. The effect of this treatment is to abolish cyanosis, to relieve dyspnoea, and to promote sleep.

In the treatment of the oedema of cardiac failure **Salysrgan** appears to be a drug of considerable value. It belongs to the organic compounds of mercury. A report shows it to be definitely less toxic than novasurol. A 10 per cent solution of the drug is used, and the dose is from  $\frac{1}{2}$  to 2 c.c., injected either intramuscularly or intravenously. D. E. Bedford<sup>6</sup> reports that he has not seen any cases of mercurial poisoning. The procedure in the treatment of severe cardiac failure with oedema is to give an initial dose of 1 c.c. intravenously, followed by doses of 2 c.c. at intervals of four days. During this period **Ammonium Chloride** in doses of 15 to 30 gr. thrice daily given by the mouth intensifies the diuresis. Treatment by digitalis need not be modified, and fluids must be rigidly restricted. If hydrothorax is present, from 30 to 40 oz. may be slowly removed by paracentesis. Ascites need not be tapped. The daily weight of the patient is a guide to the fluid excretion. Acute nephritis, though not albuminuria, is a contra-indication, and the presence of diarrhoea or colitis means caution in its use.

H. B. Sprague and A. Graybiel<sup>7</sup> record 60 cases in which salysrgan was used as a diuretic; 46 of these had cardiac failure, 8 had cirrhosis of the liver, 4 cancer, and there was 1 case each of nephrosis and ovarian cyst. In 80 per cent of these diuresis was present, and in 55 per cent the diuresis was twice the fluid intake. The authors agree that the danger is negligible, and in only one case was there a complication, mainly cellulitis of the arm and thrombosis of the vein into which the drug was injected.

E. Berger<sup>5</sup> compares the action of different salines in producing diuresis when combined with salyrgan, and she concludes that the two best drugs are **Ammonium Chloride** and **Ammonium Bromide** in doses of 8 grm. (124 gr.) twice daily.

REFERENCES.—<sup>1</sup>*Arch. of Internal Med.* 1930, Oct., 553; <sup>2</sup>*Presse méd.* 1930, Oct. 8, 1363; <sup>3</sup>*Ibid.* 1361; <sup>4</sup>*Jour. Amer. Med. Assoc.* 1930, Oct. 25, 1237; <sup>5</sup>*Glasgow Med. Jour.* 1931, April, 161; <sup>6</sup>*Proc. Roy. Soc. Med.* 1931, Feb., 429; <sup>7</sup>*New Eng. Jour. Med.* 1931, Jan. 22, 154; <sup>8</sup>*Wien. klin. Woch.* 1930, Dec. 4, 1505.

## HERNIA.

A. Rendle Short, M.D., F.R.C.S.

**The Injection Treatment.**—We referred in the MEDICAL ANNUAL for 1931 (p. 238) to a method of cure for hernia by the injection into the sac of an alcoholic solution of various astringents (krameria, etc.). A further series of successful cases is reported by R. Wolfe,<sup>1</sup> who claims 19 cures in 22 cases. From two to nineteen injections were needed to obliterate the sac.

**Technique of Operation for Inguinal Hernia.**—Every year new methods of operating are described, but probably the great majority of surgeons still content themselves with the Bassini operation in straightforward cases, and the Gallie method when there is a large ring. However, we think it our duty to notify our readers of the more rational of the new procedures.

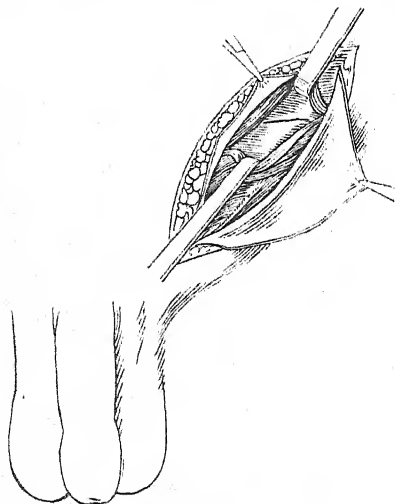


Fig. 51.—Separation of fibres of internal oblique and transversalis muscles, exposing peritoneum. Black line shows where peritoneum should be incised.

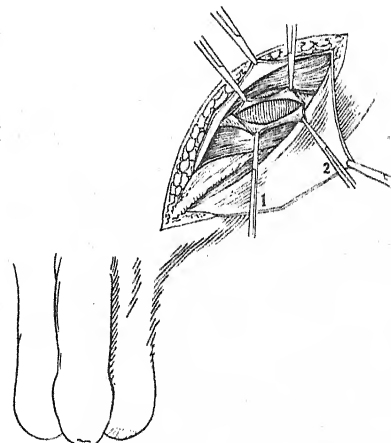


Fig. 52.—Peritoneum incised and held by four artery forceps.

(Figs. 51-54 re-drawn from the 'American Journal of Surgery'.)

S. Robinson<sup>2</sup> injects water into the sac to facilitate its removal. A. L. Soresi<sup>3</sup> describes a method which exteriorizes the sac and any bulging peritoneum and uses the sac to reinforce a weak region. The steps are as follows:—

1. The usual skin incision.
2. Exposure of aponeurosis of external oblique. A broad flap is cut on the side of Poupart's ligament.
3. Fibres of the internal oblique and transversalis are separated (not cut or torn) as in Fig. 51.
4. The peritoneum is opened (Fig. 52).

5. The internal ring is exposed and pulled out. The peritoneum beneath is pulled up taut, and closed by suture. Thus the internal ring is excluded from the peritoneal cavity (*Fig. 53*).

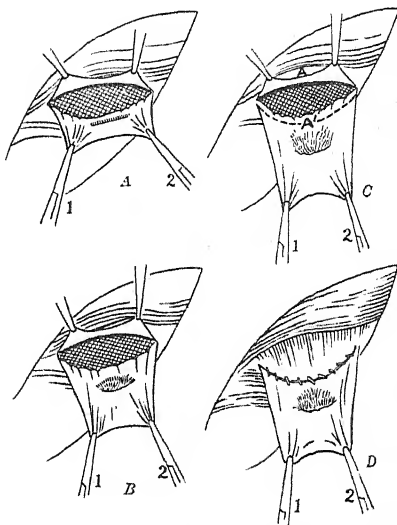
6. The sac and redundant peritoneum are secured with a stitch under the transversalis muscle, and the gap in the muscles sutured (*Fig. 54*).

7. The incision in the external oblique aponeurosis is closed, and the flap overlapped.

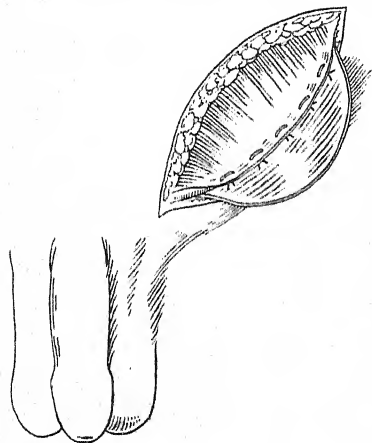
[No doubt this method is excellent to prevent an indirect hernial recurrence, but the real danger-point lies nearer the pubic spine.—A. R. S.]

G. Beccherle,<sup>4</sup> of Florence, describes a method in which a strip of sartorius muscle is used to help close the gap, in difficult cases.

E. M. Fitch<sup>5</sup> makes two small modifications of the usual Bassini operation which are probably useful. He does not slit up the external abdominal ring, but leaves it intact and incises the external oblique aponeurosis above and to the inner side. Having dealt with the sac in the ordinary way, he strips up the external oblique aponeurosis widely from the front of the rectus to expose the aponeurosis of the internal



*Fig. 53.*—Internal ring exposed with any redundant peritoneum. The figures show how the internal ring, sac, and redundant peritoneum become exteriorized when the peritoneum is sutured. A and B show that by pulling on forceps 1 and 2, the internal ring is exposed; redundant peritoneum is further exposed by means of thumb forceps not shown in illustrations in order not to complicate them. C shows lines of suture, that is, upper edge A is sewed as shown in D, to line A' indicating peritoneum below internal ring, thus excluding from peritoneal cavity internal ring, sac, and redundant peritoneum.



*Fig. 54.*—Mattress sutures tied with flap of fascia ready to be overlapped.

oblique and transversalis, which are incised in front of the rectus. One can then bring down the internal oblique and conjoint tendon to Poupart's ligament without tension (*Figs. 55, 56*). He also advocates spinal anaesthesia. In his opinion the main cause of recurrence, apart from haematoma formation and suppuration, is cutting through of the sutures in the too tense edge of the internal oblique, under the strain of post-anaesthetic vomiting or coughing.

In the *MEDICAL ANNUAL* for 1931 (p. 239), V. Schmieden's method was described and figured. A follow-up by M. Liachowitzky<sup>6</sup> shows that many of the patients get swelling of the testis or scrotum afterwards.

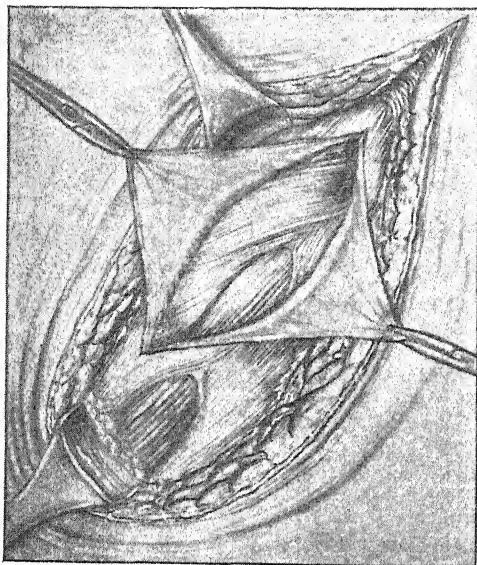


Fig. 55.—Showing extent of incisions in skin and external fascia, giving exposure of the entire inguinal canal.

Bassini's method gave the best results.

C. L. Gibson and R. K. Felter,<sup>9</sup> of New York, give the results of 1878 cases operated on for inguinal hernia between 1915 and 1928. The recurrence-rate was 3 per cent, and as usual most of these came back within a few months. The great majority were operated on by the Bassini method.

W. E. Gallie and A. B. Le Mesurier<sup>10</sup> have studied the end-results in patients operated on by the living suture method according to Gallie's well-known technique. Of about 200 cases, 6 recurred, and considering that many of those treated were very unfavourable subjects, with large, direct, or recurrent hernias, and in some cases bronchitis as well, this must be accounted very

**Sliding Hernias** of the cæcum, or of the sigmoid, or of the bladder, are often difficult to treat satisfactorily. A. D. Bevan<sup>7</sup> describes his method of operating. The mouth of the sac is often wide, and the usual transfixion and ligature is not satisfactory. Bevan invaginates the sac into the peritoneal cavity by two, three, or even four purse-string sutures of durable catgut. In very large sacs some must be excised first. Then he sews the internal oblique and conjoint tendon to Poupart's ligament as in the Bassini method.

**Statistics.**—According to E. Moen,<sup>8</sup> in Norway, a follow-up shows a recurrence of 2.2 per cent after operation for inguinal hernia.

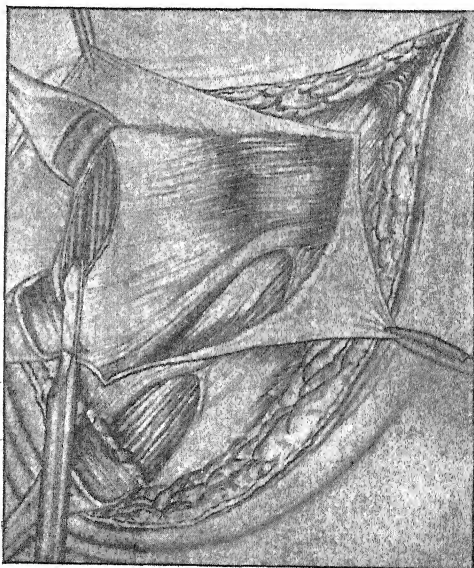


Fig. 56.—After separation of the external oblique aponeurosis from the internal oblique, the aponeuroses of the internal oblique and transversalis are cut through at the border of the rectus. (Figs. 55 and 56 by kind permission of the 'New England Journal of Medicine'.)



PLATE XXI  
VENTRAL HERNIA  
(G. J. HEBBES)

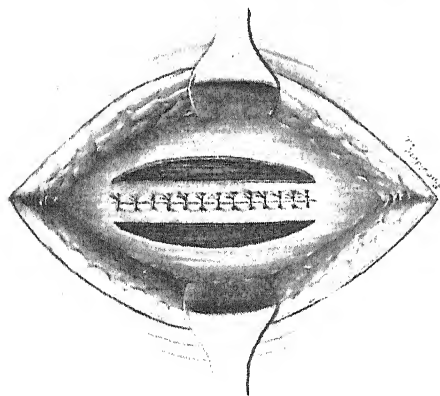


Fig. 4.—Shows the hernial sac closed, and the fascial margins sutured.  
The two parallel incisions in the fascia are indicated.

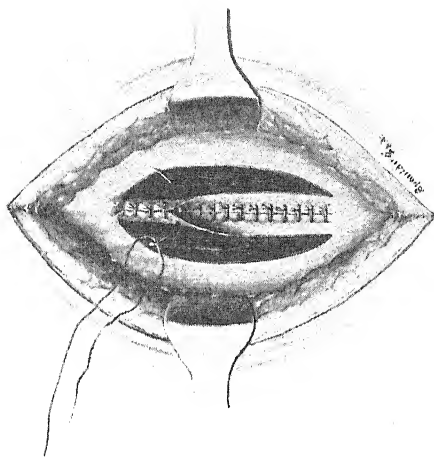


Fig. B.—Showing the method of suturing the two medial flaps.  
Plates XXI and XXII by kind permission of the  
New England Journal of Medicine.

# PLATE XXII

## VENTRAL HERNIA—continued

(L. J. HERRICK)

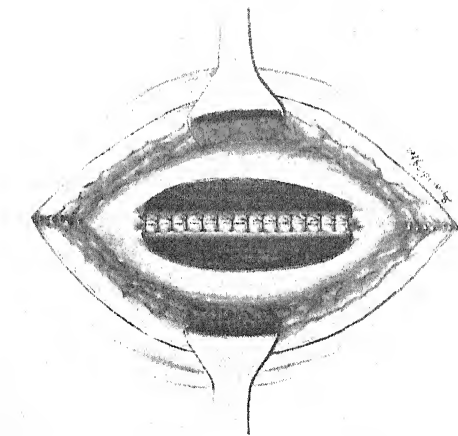


Fig. C.—Shows the preceding step completed.

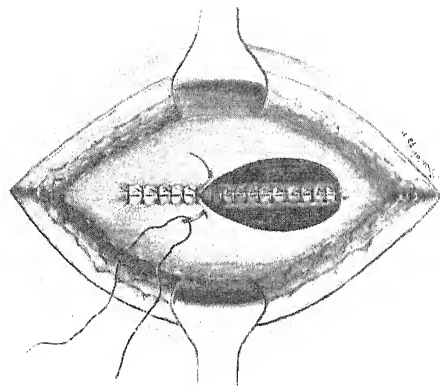


Fig. D.—Shows the approximation of the two lateral flaps.

satisfactory. The failures were due to infection in one case, to slipping of the fascial graft the end of which had been insecurely sutured in another, and to chinks between the fascial sutures in the remaining four. The gap left in the fascia lata should be closed, or the patient will complain of a bulging and feeling of weakness in the thigh.

**Strangulated Hernia.**—N. Kemm,<sup>11</sup> reporting on cases from the Bristol Royal Infirmary, found that of 74 patients with strangulated inguinal hernia or femoral hernia 13.5 per cent died. Three of the deaths were from *reductio en masse* or reduction of gangrenous gut. The lesson should be emphasized that taxis is dangerous and ought to be given up.

**Incisional Hernia.**—A method of closing an incisional hernia is given by J. J. Hepburn,<sup>12</sup> and is sufficiently explained by the accompanying illustrations (*Plates XXI, XXII*).

**Epigastric Hernia.**—According to W. Anschütz,<sup>13</sup> of Kiel, when the symptoms are localized in the hernia, nearly all give a good result after removal; when there are gastric symptoms besides, less than half are relieved.

**Obturator Hernia.**—This rare condition is discussed by G. Canavero,<sup>14</sup> of Turin, who relates a case in a woman of 69. The gap in the obturator foramen was closed by means of a flap of pectineus fascia. [Some years ago I described a case of strangulated obturator hernia in an old woman, who came up again some months afterwards for a second strangulation. This frequently happens. I opened the abdomen, released the hernia, inserted a plug of the patient's costal cartilage, cut to fit, into the sac, and closed the neck of the sac to shut it off from the peritoneal cavity. She had no further trouble.—A. R. S.]

**Diaphragmatic Hernia.**—S. W. Harrington,<sup>15</sup> at the Mayo Clinic, comments on the frequency with which this rare condition is associated with hæmatemesis, and sometimes a definite gastric ulcer. He has operated on 30 cases. In 7 of these the phrenic nerve was cut to allay diaphragmatic spasm. It gives relief, but is not a cure. In the other 23 cases Harrington attacked the hernia by the abdominal route. There were four deaths.

REFERENCES.—<sup>1</sup>*Med. Jour. and Record*, 1931, March, 243; <sup>2</sup>*Surg. Gynecol. and Obst.* 1931, April, 891; <sup>3</sup>*Amer. Jour. of Surg.* 1930, Oct., 130; <sup>4</sup>*Políclinico*, 1930, Aug., 1239; <sup>5</sup>*New Eng. Jour. Med.* 1931, Jan., 49; <sup>6</sup>*Zentralb. f. Chir.* 1931, June, 1638; <sup>7</sup>*Ann. of Surg.* 1930, Oct., 754; <sup>8</sup>*Norsk. Mag. f. Læge.* 1930, xci, 624; <sup>9</sup>*Ann. of Surg.* 1930, Oct., 744; <sup>10</sup>*Canad. Med. Assoc. Jour.* 1930, Aug., 165; <sup>11</sup>*Bristol Med.-Chir. Jour.* 1931, Summer, 151; <sup>12</sup>*New Eng. Jour. Med.* 1931, May, 1035; <sup>13</sup>*Deut. Zeits. f. Chir.* 1930, July, 88; <sup>14</sup>*Políclinico*, 1930, Nov., 541; <sup>15</sup>*Surg. Gynecol. and Obst.* 1930, Oct., 504.

## HERNIA OF THE OVARY AND FALLOPIAN TUBES.

John Fraser, Ch.M., F.R.C.S.Ed.

C. P. G. Wakeley<sup>1</sup> reviews 25 cases of hernia of the ovary and Fallopian tube, in the course of which he draws attention to several points of interest. Ninety per cent of such herniæ are inguinal, the remainder femoral; in the latter the tube rarely accompanies the ovary into the sac. The condition is commonest in girls under one year of age, and Wakeley suggests as the explanation that the ovary has descended into the pelvic cavity prematurely, before the canal of Nüch has been occluded. Normally the ovary only descends into the pelvis after the first year. The ectopic ovary usually gives rise to an obvious swelling in the inguinal or labial region; after puberty it may swell up and become painful during the menstrual periods. According to the author, the chief complications are pregnancy in the ectopic tube, cystic degeneration of the ovary, and torsion of the ovarian pedicle, with strangulation of the organ.

**TREATMENT.**—If healthy, the ovary and tube are reinstated in the pelvic cavity, and the hernial sac is excised; should the ovary be cystic, fibrosed, or strangulated, it should be removed.

REFERENCE.—<sup>1</sup>*Surg. Gynecol. and Obst.* 1930, Aug., 256.

### HERPES ZOSTER.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

H. D. Sidlick<sup>1</sup> claims to have obtained remarkably successful results in the treatment of pain in this disease by injections of **Pituitary Extract**. The treatment was originally advocated by Vandel (1923). The ordinary preparations used in obstetrics were employed. Doses from 0.5 to 1 c.c. were injected intramuscularly daily. In some cases one injection sufficed to relieve pain completely, some required as many as three injections, and one case had six. Fifty-four patients were treated, all with success. Pregnancy is the only contra-indication to the treatment, and the use of the solution was not found to be unsafe for patients with hypertension, though a momentary sensation of faintness was experienced by some of the patients treated.

E. W. Ruggles<sup>2</sup> has treated fifteen cases of herpes zoster with intravenous injections of **Sodium Iodide**: 2 gr. are given in 20 c.c. of water on the first, second, fourth, and seventh days. Two patients cleared up with two injections, and four with three. The author claims that pain is rapidly relieved and that the local lesions clear up very quickly.

REFERENCES.—<sup>1</sup>*Arch. of Dermatol. and Syph.* 1930, July, 91; <sup>2</sup>*Ibid.* 1931, March, 472.

### HIP, CONGENITAL DISLOCATION OF.

John Fraser, Ch.M., F.R.C.S.Ed.

Recent interest in congenital dislocation of the hip has centred round three controversial aspects of the question: (1) The origin of the error; (2) The choice between manipulative reduction and reduction by open operation; and (3) The problem of the painful unreduced dislocation in the individual of fifteen years or more.

1. **The Origin of the Error.**—J. Bruce<sup>1</sup> deals with this aspect of the problem. He says, "It is generally agreed that congenital dislocation of the hip is a local hypoplasia affecting more particularly the postero-superior quadrant of the acetabular rim." The displacement develops secondary to this structural defect, and Bruce proceeds to recommend the recognition of two types of displacement, the one relatively sudden in its development, post-natal in occurrence, and probably originated by the extension of the hip-joint at birth; the other gradual in its onset and post-ambulant in acquisition. There is no doubt that the constant structural error is a deficiency of the postero-superior segment. Bruce believes that the acetabular error is the primary one, and that the other changes noted are secondary, while the success or failure of treatment must depend on whether or not the original defect is repaired.

2. **Operation v. Manipulative Reduction.**—H. P. H. Galloway<sup>2</sup> has declared himself an advocate of the procedure of reduction by open operation. He indicates his dissatisfaction with the Lorenz method, and, impressed by a paper of Sherman's, now advocates reduction by open operation. It is evident that Galloway was impressed by Sherman's statement that an hour-glass contraction of the capsule was one of the main impediments to reduction, and, if Sherman's views could be substantiated, it would certainly be an argument in favour of operation, but there is increasing evidence that this error is by no means constant, and that when it occurs it is a late development, and acquired in character.

Operation is advocated at the age of 2 to 2½ years. Walking in plaster is

encouraged one month after operation, and the plaster is abandoned at the end of the fifth or sixth month. Galloway uses a Sprengel or Smith-Peterson incision, and states that exposure of the joint can be carried out rapidly and with little or no shock. This is an unduly optimistic appreciation of an operation which may sometimes be one of considerable difficulty. While Galloway may be satisfied with his personal results, the general standard of manipulative results is so good that the case must be made more convincing before his claim will meet with universal acceptance, and, as things are at present, we feel that open operative reduction should be limited to such cases as have defied manipulative treatment.

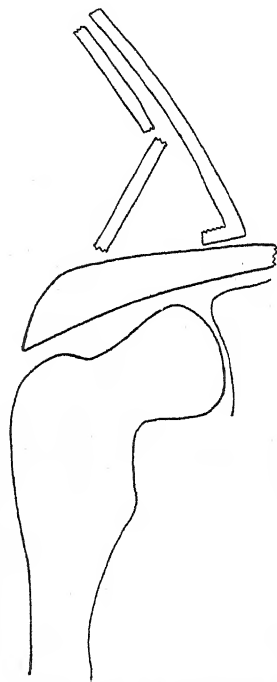
Various operative procedures to deal with the unreduced hip are discussed. R. Massart<sup>3</sup> recommends a bifurcation operation on the Lorenz plan, in combination with a buttressing of the upper rim of the deficient acetabulum. Osteotomy is done through the lesser trochanter, and the upper end of the lower fragment is placed within the true acetabulum. Through a Smith-Peterson incision the acetabular area is now exposed, and the imperfect postero-superior rim is turned downwards as a flap, so as to buttress the deficient area. [To the reviewer this operation seems unnecessarily complicated, for, if the bifurcation and acetabular implantation affords stability, what advantage is there in further stabilizing a femoral head which will play no part in weight-bearing?—J. F.]

R. Soutter<sup>4</sup> reviews previous suggestions regarding acetabular grafts and shelves designed to prevent displacement of the head. He then describes a method which he has recently practised with good results. The technique involves the cutting of a strong graft from the outer surface of the great trochanter, and the insertion of the graft into the outer surface of the ilium, where it is buttressed by a small bone-flap lifted from the iliac bone (*Fig. 57*). The operation is open to the criticism that the acetabular roof thus formed is so unnecessarily large that its very bulk renders it liable to absorption. Gill has shown that the degree of reconstruction of the acetabular rim need not exceed the bulk of the normal arrangement.

G. Laserre<sup>5</sup> suggests that the complete acetabular area may be lowered. The bone setting is detached so as to include the cotyloid and capsular ligaments, and the entire articular area is then pushed downward to a lower level. It is not stated that the method has been put to the test of practice, and it would surely seem that the shortening of the pelvi-femoral groups of muscles would prevent any such procedure.

Many types of buttressing operation have been described, but none has improved upon the technique originally suggested and practised by Gill.

The *end-results* of congenital hip dislocation are discussed by M. Lange<sup>6</sup> and E. L. Evans.<sup>7</sup> Lange bases his figures on the results of 1500 cases demonstrating 2700 dislocations. He accepts an interval of three years as sufficient



*Fig. 57.*—Soutter's 'buttressing' operation in congenital dislocation of the hip. (By kind permission of *Surgey, Gynecology and Obstetrics*.)

to justify an opinion regarding the ultimate result. This time standard seems too short; eight to ten years is a more efficient test. His figures, however, contain several points of interest. Readers will be surprised to learn that failure to reduce by either manipulation or open operation occurred in only 5 per cent of cases; the figure is unusually low. Instability with re-dislocation was recorded in 7.5 per cent, and it is significant, in view of the arguments put forward by Galloway, that in only 5 per cent of the cases was there such ligamentous deformity as to interfere with reduction—the real difficulty, both in reduction and stability, was a flat acetabulum (75 per cent). Lange's figures record an anatomically perfect cure in 63.7 per cent of cases.

From 1903 to 1920 Evans was responsible for the treatment of 70 cases, and 25 of them form the subject of his analysis. The average age at reduction was  $4\frac{1}{2}$  years, and the average period since reduction fifteen years. Treatment consisted in manipulative reduction by the Lorenz technique in the early cases of the series, and by more gentle manipulative methods in the later cases. The post-reduction plaster fixation period varied from one month to one and a half years, no walking was permitted until three months after the plaster had been abandoned, and a plaster bed holding the hip at  $90^\circ$  of flexion and  $70^\circ$  of abduction was advised for three years following reduction. The results were as follows: Bad 1, poor 2, good 13, perfect 9 cases. These figures are most encouraging, and surely constitute a reply to the attitude which urges universal operative reduction.

**3. Painful Unreduced Dislocation.**—The painful unreduced dislocation in the girl approaching adolescence forms one of our greatest orthopaedic problems. The subject was discussed at the Congress of the International Society of Orthopaedists held in Paris last year, but it cannot be said that agreement of opinion was revealed.

A. Kreutz,<sup>8</sup> of Berlin, strongly favoured the bifurcation operation of Lorenz, and the results which he reviewed created a favourable impression.

Gaenskem (Milwaukee) committed himself to no definite decision, but he was evidently attracted by the shelf operation. He made the interesting statement that the proportion of painful unreduced hips is 1 in 1000 cases, which seems an unduly low figure.

Fairbank (London) gave a masterly review of the position. The following were the leading points of his paper. The cases might be grouped into two classes, the moderate and the severe; in the former pain resulted from muscular spasm, contraction, and fatigue, in the latter arthritis was always present; where severe pain existed, it was a complication of the subluxated hip rather than of the completely dislocated type, because it was in the former variety that arthritis was more liable to develop. Fairbank regarded an arthrodesis as the only certain method of relieving pain, while next in value came osteotomy. He apparently did not attach much value to the shelf operation, though he agreed that it afforded temporary relief. Where both hips were affected he had no doubt that osteotomy held out the best prospects.

Putti (Bologna) advised that the age period associated with the problem be divided into two, from 12 to 22 years, and beyond that period. He insisted on the importance of early diagnosis and treatment, pointing out that early recognition meant the disappearance of the problem under discussion. He did not recommend attempts at reduction by open or closed means, urging instead the value of solid and para-articular arthrodesis, or, if these procedures proved unsuitable, the bifurcation operation of Lorenz.

Ombredanne (Paris) favoured a low subtrochanteric osteotomy combined with an acetabular buttress, a procedure which appears unduly complicated.

Nové-Josserand (Lyons) practised an osteotomy immediately below the

lesser trochanter, the abduction of the limb to an angle of  $15^{\circ}$  to  $20^{\circ}$ , and the placing of the upper end of the lower fragment against the lateral wall of the pelvis, not of necessity in the acetabulum.

Various other observers expressed their views, but it is unnecessary to report them in detail, though this may be said, that, if a vote had been taken, the majority would have recorded in favour of a subtrochanteric osteotomy of either the Lorenz or the Kirrison type; a smaller number would have favoured arthrodesis, preferably by the extra-articular method; while a still smaller number would have advocated a shelving operation. No one advised attempting reduction by open operation.

REFERENCES.—<sup>1</sup>*Practitioner*, 1930, Nov., 642; <sup>2</sup>*Brit. Med. Jour.* 1930, ii, 409; <sup>3</sup>*Bull. et Mém. Soc. de Chir.* 1930, xxii, 283; <sup>4</sup>*Surg. Gynecol. and Obst.* 1930, Aug., 249; <sup>5</sup>*Bord. Chir.* 1930, No. 1, 42; <sup>6</sup>*Verhandl. d. Deut. orthop. Gesellsch.* 1930, 119; <sup>7</sup>*Brit. Med. Jour.* 1930, 1035; <sup>8</sup>*Presse méd.* 1930, Dec. 3, 1644.

### HIRSCHSPRUNG'S DISEASE.

John Fraser, Ch.M., F.R.C.S. Ed.

The origin of this condition remains obscure, but there is a growing body of evidence in favour of the view that it results from a state of unbalance between the sympathetic and para-sympathetic sections of supply from the autonomic nervous system, and that an undue preponderance of sympathetic stimulation results in excessive contraction of the sphincteric region (O'Beirne's sphincter and the internal anal sphincter), while the longitudinal fibres of the bowel wall are inhibited. The result is that contents cannot be expelled, accumulation of faeces ensues, with the sequelæ of bowel dilatation, wall hypertrophy, and mucous membrane catarrh or ulceration. There is no doubt that this neuropathic theory affords a more reasonable explanation of the origin than either the mechanical or the inflammatory theories.

In these days, when surgical interference is so popular, we are inclined to forget that Nature has her own methods of dealing with body disorders of certain types. It has long been recognized that in congenital stenosis of the pylorus—a condition which has many points of similarity to Hirschsprung's disease—there is a tendency to natural cure, if life can be maintained. W. Anschutz<sup>1</sup> reminds us of this parallel. Quoting Askupmark, of the Petren Surgical Clinique in Lund (Sweden), he says, "Of 102 cases of Hirschsprung's disease collected from Swedish hospitals, the after-history of 67 has been traced over periods ranging from one to twenty-five years." The interesting facts emerge that, of 38 cases treated conservatively, 24 regained normality or were greatly improved, 5 were slightly improved, 6 were stationary or worse, while 4 succumbed to the disease. Of 29 cases treated by operation, 13 were normal or greatly improved, 8 were benefited, 2 were stationary or worse, while 6 had died from the disease. According to these figures, the results of conservatism were better than those of operation, but the thesis is an illustration of the unreliability of statistics, for we are not made acquainted with the degree of severity of the disease in the different groups. It is very likely that the less severe types were treated by conservative measures, and to that extent, of course, the conclusions are unreliable. None the less, a statement of this kind provides food for thought. (See also SYMPATHETIC NERVOUS SYSTEM, SURGERY OF.)

TREATMENT.—The primary interest of the present, however, is concerned with treatment. Since the publication of the article by Royle and Wade in 1927, **Ramisection** and **Lumbar Ganglionectomy** have become popular and effective methods of dealing with the disease. R. B. Wade<sup>2</sup> records his results in thirteen cases, the age varying from 1 month to 12 years. In all these constipation was strikingly improved, but Wade states, "It was disappointing to see that the abdominal distension and the dilatation of the colon

remained apparently unchanged." He adds, however, that a considerable time must elapse before distension disappears. Wade's figures afford the best standard for judging the results of sympathectomy over a reasonable period,

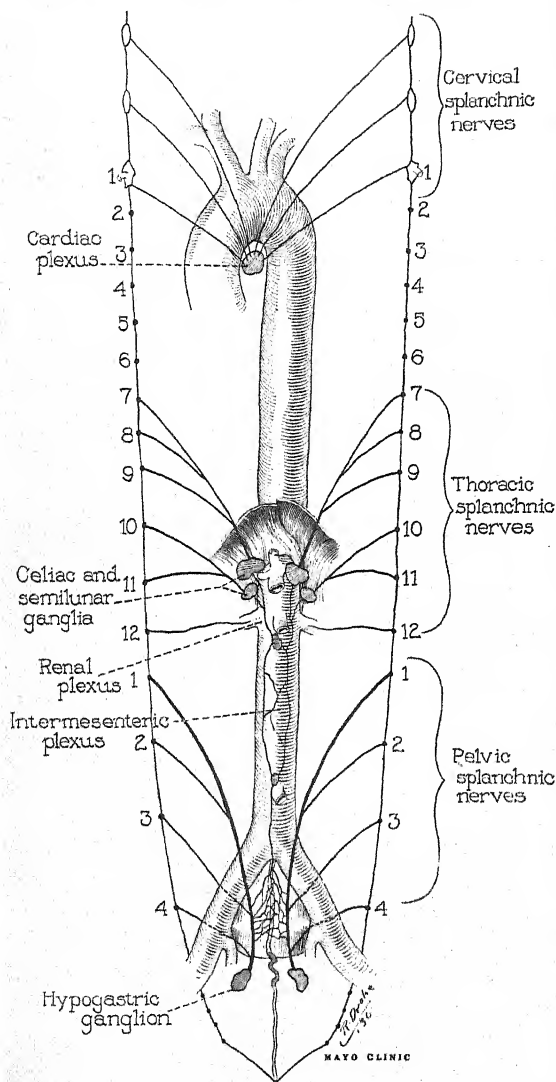


Fig. 58.—Delmas' conception of the distribution of the sympathetic system. The pelvic splanchnic nerves, derived from the four lumbar sympathetic ganglia, supply only pelvic viscera. (Re-drawn from Delmas.) (By kind permission of 'Annals of Surgery'.)

and the reviewer is left with the feeling that the later results scarcely fulfil the optimism which earlier results appeared to justify.

Debate still centres round the best method by which removal of the sympathetic supply to the lower end of the colon may be achieved. Royle and Wade favour the posterior route originally suggested by Royle. In this country the relatively simple operation of lumbar ganglionectomy (3rd, 4th, and 5th) performed by the trans-abdominal route holds favour. Recently F. W. Rankin and J. R. Learmonth<sup>3</sup> have practised the method of removal of the presacral nerve, in conjunction with the principal roots of the inferior mesenteric plexus lying on each side of the inferior mesenteric artery. They claim that by this means the denervation is more complete than by the method of lumbar ganglionectomy. (Fig. 58 and Plates XXIII, XXIV.)

Anschutz<sup>1</sup> throws some doubt on the permanency of benefit following sympathectomy. His own practice is to remove the pelvic colon, using the Bloch-Mikulicz Technique. Twenty cases were treated on this

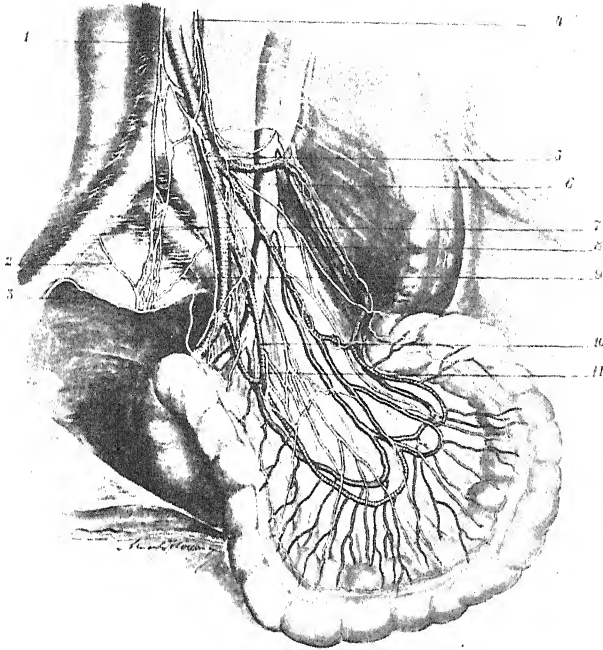
plan, with two deaths, and in Anschutz's opinion the post-operative functional



# PLATE XXIII

## SYMPATHECTOMY FOR HIRSCHSPRUNG'S DISEASE

(F. W. RANKIN and J. R. LEARMONTH)



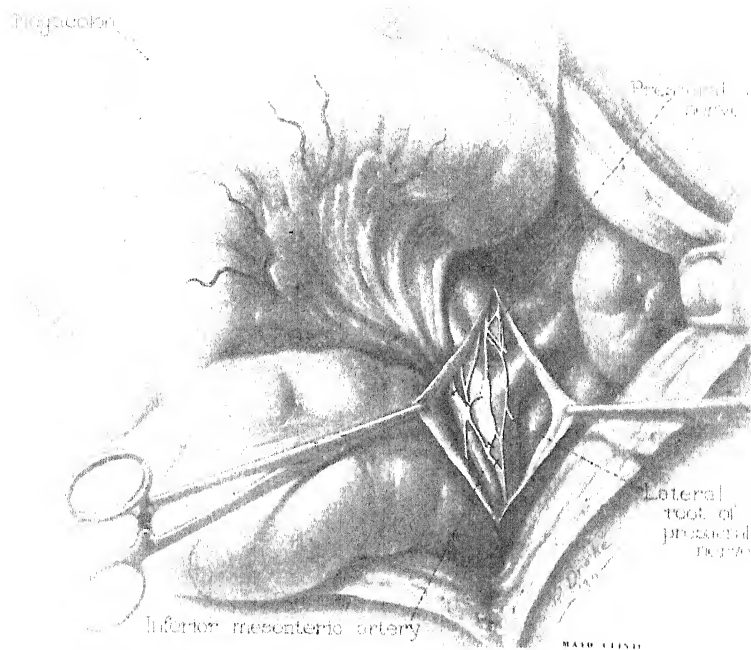
*Fig. 1.*—The inferior mesenteric nerves: 1, Intermesenteric nerves of right side; 2, Branch from right fourth lumbar ganglion to presacral nerve; 3, Cut edge of peritoneum; 4, Intermesenteric nerves of left side; 5, Inferior mesenteric nerves; 6, Inferior mesenteric vein; 7, Presacral nerve; 8, Sigmoid artery; 9, Branch from left fourth lumbar ganglion to presacral nerve; 10, Sigmoid artery, and 11, Sigmoid artery. (Taken from *Hirschsprung*.)

*Plates XXIII and XXIV by kind permission of  
'Annals of Surgery'*

# PLATE XXIV

## SYMPATHECTOMY FOR HIRSCHSPRUNG'S DISEASE *Continued*

(F. W. RANKIN and J. R. LEARMONTH)



*Fig. B.*—The field of operation. After division of the presacral nerve, the inferior mesenteric nerves are removed by dividing them at the points indicated.

PLATE XVI.—HIRSCHSPRUNG'S DISEASE TREATED BY LUMBAR GANGLIONECTOMY

(W. MEYER)

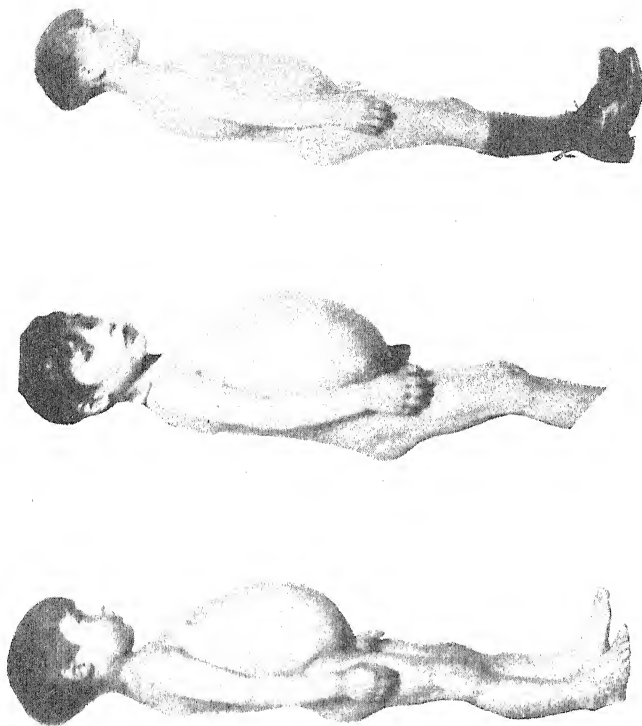


Fig. A.

Fig. B.

Fig. C.

Fig. A.—The ordinary appearance of the patient two years before operation. Fig. B.—The patient five months after the operation. Fig. C.—The patient two years after the operation.

MEDICAL ANNUAL, 1932

By kind permission of the  
Edinburgh Medical Journal



results have been as good as, if not better than, those recorded by any other method.

As things are at present, opinion favours the sympathetic operation in one or other of its various types. It is recognized that it must be regarded as an experimental procedure; but, in so far as it may be described as a physiological operation, it is attractive, and there is increasing evidence that its results are favourable. In addition to the papers already quoted, the operation has been favourably reported on by W. Mercer<sup>71</sup> (*Plate XXV*) and A. L. McGregor.<sup>5</sup>

REFERENCES.—<sup>1</sup>*Zentralb. f. Chir.* 1931, April 11, 912; <sup>2</sup>*Jour. Coll. of Surg. of Australasia*, 1930, July; <sup>3</sup>*Ann. of Surg.* 1930, Oct., 710; <sup>4</sup>*Edin. Med. Jour.* 1931, July, 105; <sup>5</sup>*Jour. Med. Assoc. S. Africa*, 1930, Oct. 11, 589.

### HODGKIN'S DISEASE (Lymphadenoma).

Stanley Davidson, M.D., F.R.C.P.E.

ETIOLOGY.—During the past twenty-five years an enormous amount of experimental work has been carried out into the etiology of Hodgkin's disease. Opinion has been strongly divided between the neoplastic and infective origin of the disease. An excellent review of the etiology, comparative pathology, and experimental investigation of the disease is issued by L. Utz and L. Keatinge.<sup>1</sup> Recent studies by Elise l'Esperance,<sup>2</sup> if confirmed, are strongly in favour of an infective origin, and the definite claim is made that Hodgkin's disease is an infection with the avian tubercle bacillus. The author, having noticed that in the animal inoculation experiments previously reported, only guinea-pigs, rabbits, and monkeys had been used, believed that since these animals were relatively insusceptible or immune to avian infection, the Hodgkin's material should be inoculated into fowls. Moreover she states that if the guinea-pigs and rabbits are made more susceptible by preliminary sensitization with human tubercle bacilli, subsequent infection of avian tubercle bacilli produces widespread disease. She claims to have been successful in producing avian tuberculosis, both in the fowl and in guinea-pigs and rabbits, by the injection of material from lymphadenomatous tissue. A skin reaction similar to von Pirquet tuberculin reaction was tried in human beings suffering from Hodgkin's disease, using avian tuberculin. The results, however, were only moderately satisfactory, and the author is doubtful whether it is possible to produce a specific reaction by the skin test which will distinguish avian from the human tubercle bacillus.

#### Lymphoma Malignum (Hodgkin's Disease) and Lymphosarcoma.—

I. Levin<sup>3</sup> publishes a study on the clinical and pathological findings of more than 500 cases of Hodgkin's disease and lymphosarcoma. He believes that both diseases are phases of the same pathological entity, and may exist in the same patient or even in the same region, and that both conditions are malignant tumours. Inflammatory lymphadenitis may be a precursor of a malignant lymphoma or lymphosarcoma. Radiotherapy employed as in cases of cancer with metastasis has been found extremely useful. This means not only the involved area must be treated, but also adjacent areas that are potentially malignant. If this were done in early cases, prognosis would be greatly improved and the life of the patient would be prolonged.

**Acute Hemolytic Anæmia in Hodgkin's Disease.**—During the past two years the reviewer<sup>4</sup> has seen a number of cases of acute hemolytic anæmia associated with Hodgkin's disease. The essential features of these cases were: (1) A severe anæmia of the megaloblastic type with red blood-corpuscles down to one million or less, and a high colour index—from 1.1 to 1.5. (2) Marked blood destruction, as evidenced by high reticulocyte percentage counts—from 10 to 60 per cent—continued for weeks or months, with little or no increase of

the total red-cell count; a high icterus index and strongly positive delayed direct and indirect van den Bergh reaction. (3) No fragility to hypotonic saline. (4) Splenomegaly. All the cases died, and the three which came to autopsy had widespread generalized lymphadenoma. Four other cases with identical blood pictures and with splenomegaly have been repeatedly examined. No evidence of Hodgkin's disease can be found. In one case a spleen weighing 1700 grm. was removed at operation, and histological examination revealed no evidence of lymphadenoma or any of the features of acholuric jaundice. It was for these reasons that the reviewer has suggested (*see* JAUNDICE, ACHOLURIC) the necessity for using the general term 'acute or chronic haemolytic anæmia' for the cases with normal fragility, until a satisfactory classification on the basis of more accurate knowledge is forthcoming.

REFERENCES.—<sup>1</sup>*Med. Jour. of Australia*, 1931, April, 397; <sup>2</sup>*Ann. of Surg.* 1931, Jan., 162; <sup>3</sup>*Jour. Amer. Med. Assoc.* 1931, Feb., 421; <sup>4</sup>Communication to Meeting of Association of Physicians, London, 1929, and Sheffield, 1930.

**HOOKWORM DISEASE.** (*See* ANKYLOSTOMIASIS; WORMS, INTESTINAL.)

**HYDROCELE.** (*See also* INJECTION TREATMENT.)

#### HYDROCELE IN CHILDREN.

*John Fraser, Ch.M., F.R.C.S.Ed.*

In adults the injection of irritant substances into the distended tunica vaginalis frequently fails to cure a hydrocele. D. Levi<sup>1</sup> assures us that in children "following injection, the hydrocele disappears without discomfort or any other noxious effects." He recommends 1 c.c. of a 5 per cent solution of **Sodium Morrhuate**. From his description it would appear that his communication refers to the vaginal type of hydrocele—a fact not clearly stated. Such hydroceles are usually the result of trauma during birth, and almost invariably settle down without treatment. Further, Levi himself draws attention to the risk of inducing inflammation, and later stricture, of the ductus deferens by the injection of irritants, and this fact, coupled with the usually transient nature of the error, seems to render the treatment he sponsors unnecessary and dangerous.

REFERENCE.—<sup>1</sup>*Brit. Med. Jour.* 1931, i, 973.

#### HYPERINSULINISM AND HYPOGLYCÆMIA. (*See also* DIABETES; OBESITY.)

*W. Langdon Brown, M.D., F.R.C.P.*

Now that attention has been called to this syndrome (*see* MEDICAL ANNUAL, 1931, p. 175), observations on the subject are accumulating rapidly. D. G. Gaumon and W. C. Tenery<sup>1</sup> have grouped the cases of hypoglycæmia as follows: (1) From disturbance of carbohydrate control: (a) through overproduction of insulin by hyperfunction, hypertrophy, or tumour of the islets; (b) through loss of the substances that are antagonistic to insulin, as in hypo-adrenalism, hypothyroidism, pituitary dysfunction, or combinations of these. (2) From interference with storage or release of glycogen in the depôts of the body—the liver and muscles—or from depletion of glycogen from physical efforts. (3) From conditions in which dextrose is lost from the body as such, e.g., in renal diabetes, or as other sugar in lactation. The most important cause, by far, is that of overproduction of insulin. They recall an interesting case reported by Gray and Feemster in 1926: a child born of a diabetic mother died of hypoglycæmic shock; there was enlargement of the cell islets, which was attributed to an attempted compensation for the hormone missing in the maternal circulation. They report a case of 'dysinsulinosis' under their own care in which the patient was completely relieved by the frequent ingestion of carbohydrate

food. The paper contains a useful table of all recorded cases. In general, their conclusions agree with those of Maranon (*see below*).

A. D. Carr and others<sup>2</sup> report a case in a youth of 19 who suffered increasingly from attacks similar to those resulting from an overdose of insulin. For a time these were relieved by dextrose, but as the attacks became increasingly severe, operation was considered justifiable. A localized tumour in the pancreas which consisted chiefly of B. islet cells, was found and removed; complete recovery followed.

A. W. Phillips<sup>3</sup> reports a fatal case of uræmia complicated by hypoglycæmia in which hypertrophy of the cell islets was found in addition to the nephritis. G. H. Tuttle,<sup>4</sup> discussing hyperinsulinism in general, states that he has found insulin still present in depancreatized dogs; this he calls 'cellular insulin', and he refers to cases of primary cancer of the liver or adrenal cortex associated with hypoglycæmia. He wonders whether the increase in such cellular insulin is the cause or effect of such tumours. It might, however, be pointed out that in the cases he specified the lesions were such as would disturb the insulin balance, for extensive carcinoma of the liver would prevent insulin from effecting glycogen storage and therefore leave it free to reduce the sugar of the blood, while the adrenal tumour might well remove an antagonist to insulin. Therefore a relative rather than an absolute hyperinsulinism might result.

The whole question of hypoglycæmia naturally leads on to the consideration of the associated ketoses, which have been ably reviewed by E. Maranon.<sup>5</sup> Clearly, ketosis is due to a lack of sugar that can be utilized by the organism whether because, as in diabetes, the sugar cannot be used, or because the intake of carbohydrate reserve has been depleted by some pathological state. Although a normal individual deprived of sufficient carbohydrate will develop some ketosis, toxic symptoms are absent or trivial. Even professional fasters and hunger strikers suffer little from ketosis. The reserves of a normal individual are very considerable in this respect. Indeed, some states of starvation, such as those due to an obstruction in the upper part of the alimentary tract, may show alkalosis, which is then generally accompanied by tetany. In such cases, according to Maranon, the liver contains its normal store of glycogen; this he attributes to the action of the parathyroids, which have an effect analogous to that of the pancreas on glycogen metabolism. It is not clear, however, from his paper, why tetany should supervene if the parathyroids are active.

A specially interesting group are the diseases which lead to exhaustion of the glycogen reserves. For instance, Addison's disease habitually shows a tendency to ketosis, which intensifies as the disease becomes graver. The adrenal deficiency interferes with the mobilization of glycogen from the liver, and therefore the administration of insulin will tend to aggravate the condition by increasing glycogen storage in the liver. It is well known that adrenalin and insulin are antagonistic in their effects on the liver, so that a defect in the former will really be increased by giving the latter. Maranon regards the terminal encephalopathies of Addison's disease as due to this resulting ketosis.

He places the ketosis of pregnancy to this same hypoglycæmic group, and records a severe example in a pregnant woman who had aggravated her condition by a 'slimming' diet. Further, he attributes post-operative ketosis largely to the preparatory diet being poor in carbohydrates, therein agreeing with the results of the collective investigation carried out some years ago at the Hospital for Sick Children, Great Ormond Street, and reported by R. S. Frew. In such cases if insulin is given, the simultaneous administration of dextrose is imperative. This is equally true of other hepatic toxæmias, but not in cirrhosis of the liver, where the store of glycogen is sufficiently well conserved. Nevertheless

the reviewer agrees with those who have found benefit, even in cirrhosis, if dextrose and insulin are given together.

Maranon confirms by direct observation the views of Hector Cameron that the cyclical vomiting of children is associated with hypoglycaemia, but regards the tendency as possibly originating in the vegetative nervous system, which interferes with the storage of glycogen in the liver.

In hyperthyroidism there is a similar tendency to emptying of the glycogen reservoirs, to which the author refers such complications as the tachypnoea, diarrhoea, and paroxysmal vomiting which sometimes occur, as well as the graver symptoms of sub-icterus and coma. The liability to serious post-operative accidents is similarly explained. For this reason he advises a diet rich in carbohydrates with or without insulin. To insulin alone such patients are, as might be expected, unduly sensitive. He does not find this incompatible with their known tendency to hyperglycaemia and glycosuria, for in such states emptying of the glycogen reservoirs can still occur, thanks to the excess of thyroxin.

Insulin can, of course, produce similar hypoglycaemia with ketosis in the normal subject, especially when fasting, and he reminds us of the ease with which even in diabetes, insulin can convert diabetic coma into a hypoglycaemic one, unless dextrose is given in some form at the same time. Insulin is not, in itself, a remedy for ketosis as it is for hyperglycaemia.

J. Mouzon,<sup>6</sup> in a critical review of cases of hyperinsulinism due to tumours of the pancreatic islets, calls attention to two interesting facts. The liver is particularly rich in glycogen in such cases, and when metastatic deposits occur in the liver, the presence of insulin can be demonstrated in such deposits. He suggests that *formes frustes* of hyperinsulinism may enter into the etiology of certain groups of asthenias, anxiety neuroses, cyclothymia, narcolepsy, hysterical crises, and even epilepsy. Certainly the symptoms produced by an overdose of insulin suggest this possibility.

N. B. Laughton and A. Bruce Macallum<sup>7</sup> claim to have isolated from duodenal mucosa a substance (not secretin) which has a specific effect in stimulating a secretion of insulin by the islets. This, if confirmed, is a valuable step forward in our understanding of the mechanism of carbohydrate metabolism.

REFERENCES.—<sup>1</sup>*Arch. of Internal Med.* 1931, June, 828; <sup>2</sup>*Jour. Amer. Med. Assoc.* 1931, April 25, 1363; <sup>3</sup>*Ibid.* April 11, 1195; <sup>4</sup>*New Eng. Jour. Med.* 1931, May 14, 1039; <sup>5</sup>*Presse méd.* 1930, Dec. 24, 1765; <sup>6</sup>*Ibid.* Aug. 27, 1157; <sup>7</sup>*Canad. Med. Assoc. Jour.* 1930, Sept., 348.

**HYPERPIESIS.** (See ARTERIES, DISEASES OF; BLOOD-PRESSURE, HIGH.)

**HYPERTHYROIDISM.** (See also ENDOCRINOLOGY; GOITRE.)

W. Langdon Brown, M.D., F.R.C.P.

INCIDENCE.—Thyrotoxicosis is evidently more frequent in later life than has been thought. J. M. Mora and E. I. Greene<sup>1</sup> found that out of 200 consecutive cases, 18.8 per cent were operated upon between the ages of 50 and 76. The average interval between the appearance of the goitre and the onset of symptoms was 14.5 years, yet two-thirds of them were of the primary type, the remainder being nodular goitres.

PATHOLOGY.—D. Marine<sup>2</sup> considers that the most outstanding manifestation of Graves' disease is a loss of control over tissue oxidation which he refers to an attempt at compensation for a lack of adrenalin by an over-production of thyroxin. Against this must be placed the views of Crile and others that hyperthyroidism is accompanied by an excessive production of adrenalin.

G. Scott Williamson and Innes Pearse,<sup>3</sup> carrying on their former researches, state their present position as follows: the thyroid apparatus has two functions,



one the storage of colloid within the thyroid gland (the iodocolloid function), the other the production of a secretion by the thyroid which causes lymphocytosis in the thymus (lymphogenic function). Involution of the lymphoid tissue is an accompaniment of puberty, when there is a transference from the lymphogenic to the genital function. At the menopause there is a re-appearance of lymphocytes in the mediastinal thymus. There is a peculiar diathesis in those individuals who acquire thyrotoxicosis, due to the persistence of a prepubertal state of thyroid function. For thyrotoxicosis to occur there must be both active genital function and a persistent status thymo-lymphaticus. A restless asthenia is typical of the diathesis; the handicap of a low diastolic starting-point for the blood-pressure is a factor in this. The exophthalmic group of symptoms they attribute to a dystrophy of the lymphogenic function, the thyroxin intoxication to a dystrophy of the iodocolloid function. But in this connection it must be noted that W. Russell Brain<sup>4</sup> has adduced strong evidence that the exophthalmos is due to changes in the upper part of the mid-brain. Again, C. A. Hellwig,<sup>5</sup> in disputing Wertheim's theory that the condition of the thyroid gland in Graves' disease is not the chief pathogenic factor, but an incidental complication and sequel of a constitutional anomaly, regards lymphocytic filtration of the thyroid as a purely local response to hyperplasia and hypersecretion.

**SIGNS AND SYMPTOMS.**—The following additional points have been noted. F. H. Lahey<sup>6</sup> calls attention to what he terms the 'apathetic' type of hyperthyroidism occurring in elderly people with marked loss of weight. He regards them as bad operation risks; they stand the operation well, but go back to bed to die very unexpectedly. Harris and Boothby<sup>7</sup> point out that anoxæmia is specially liable to occur because of the increased oxygen consumption. Any obstruction to respiration by the enlarged gland increases this tendency and may lead to pulmonary oedema, which in its turn increases anoxæmia, so that a vicious circle is established. Treatment by the **Oxygen Chamber** or tent helps to relieve symptoms and is specially beneficial to patients with post-operative pulmonary oedema, bronchopneumonia, or respiratory obstruction accompanied by cyanosis or impending cyanosis. J. B. Youmans,<sup>8</sup> studying, as others have done, the rate of absorption of intradermally injected salt solution in patients with thyrotoxicosis, finds that this is slower in untreated cases than normal. After operation or iodine treatment, it returns to within normal limits. A. Brown,<sup>9</sup> following out the suggestion of sympathetic and vagus antagonism, finds that there is a diminished secretion of hydrochloric acid in the gastric juice of patients with this disease as might be anticipated from their increased sympathetic activity. R. L. Mason and others<sup>10</sup> find that the cholesterol content of the blood is diminished in hyperthyroidism and increased in hypothyroidism.

**Masked Thyrotoxicosis.**—Increasing attention is being paid to the frequency with which remote symptoms are present in thyrotoxicosis, while the cardinal signs are obscured. W. W. Hamburger and M. W. Lee,<sup>11</sup> maintain, however, that the basal metabolic rate is always raised. Such patients may have auricular fibrillation or congestive heart failure, or anginal-like attacks which are relieved by iodine. They also call attention to hyperemesis, as do H. A. Freund and W. B. Cooksey<sup>12</sup> in describing cases of thyrotoxicosis in elderly persons without signs of goitre. P. K. Gilman and W. E. Kay,<sup>13</sup> however, report five cases of unrecognized thyroid adenomata producing marked nervous symptoms without any increase in the basal metabolic rate, which were greatly improved by operation. I. Bram,<sup>14</sup> in discussing thyroid obesity, refers to cases which, though apparently of this kind, were really in a condition

precedent to Graves' disease. Careful examination will reveal some characteristic stigmata, however. He emphasizes the real danger of thyroid extract in such cases. [The reviewer saw a severe case of Graves' disease with glycosuria following on the taking of thyroid extract for obesity, which appeared to be of this order.—W. L. B.]

*Pregnancy and Hyperthyroidism.*—G. S. Fahrni<sup>15</sup> considers that interruption of a pregnancy when complicated by hyperthyroidism is much more dangerous than thyroidectomy between the third and the fifth month. From then to full term he advises conservative treatment, with consideration of the question of operation not too soon after. He does not believe that the child is liable to congenital deformities as has been stated.

*Basal Metabolic Rate.*—Attempts have been made to find a formula for this to avoid its determination by oxygen intake and carbon-dioxide output. Reed's formula is the best known of these, but A. M. and C. H. Gale<sup>16</sup> believe that

$$\text{P.R. (pulse-rate)} + \text{P.P. (pulse-pressure)} - 111 = \text{B.M.R.}$$

is more accurate. B. B. Sharp<sup>17</sup> thinks that a more reliable figure will be arrived at if, when P.R. + P.P. is less than 111, the amount subtracted is  $111 + 5$ , but when less than 91,  $111 + 10$  should be subtracted. Lian and others<sup>18</sup> find, as did Eason previously, an increased pulse-pressure range in Graves' disease, which they attributed to increased sympathetic action. But Eason was careful not to correlate the degree of this increase with the amount of rise in the metabolic rate. Indeed, it is difficult to see how a satisfactory estimate of the B.M.R. can be made without taking the superficialities of the individual into consideration.

*Iodine and the Thyroid Gland.*—Ever since Plummer's revival of treatment by iodine in 1922, great interest has been taken in the subject. It will be seen by the recent papers quoted that opinion is crystallizing in favour of restricting its use to the pre- and post-operative period. M. N. Fulton and H. L. Alt<sup>19</sup> maintain that the form in which the iodine is given for the pre-operative preparation appears to be a matter of indifference.

W. Lewis<sup>20</sup> considers that compared with the pre-iodine period, there are apparently fewer deaths from thyroid crises, post-operative storm (which is surely another manifestation of a thyroid crisis), and intercurrent disease. There is also a lower incidence of thymicolymphatic hyperplasia.

R. B. Graham<sup>21</sup> is against iodine treatment except during pre- and post-operative periods. He is emphatic that it never cures hyperthyroidism. "A nodular goitre always calls for operation."

W. O. Thompson and others<sup>22</sup> state that the minimum dose of iodine which will produce the maximum reduction in the B.M.R. is 6 mgrm. a day, while the smallest dose to produce any effect is usually 1.5 mgrm. a day. Before operation it is desirable to give suddenly an adequate excess of iodine and not to precede this with small doses. The B.M.R. will then begin to fall in one to four days. But they think the usual doses are still too big.

R. C. Austin and H. H. Wagner<sup>23</sup> consider that patients who have had a poor response to iodine before operation are more prone to residual symptoms or to have recurrences, while patients who are given iodine post-operatively maintain a lower B.M.R.

Roy Fraser and A. R. Cameron<sup>24</sup> find that large quantities of **Vitamins A and D** may help very much in the pre-operative treatment of Graves' disease together with 0.21 gm. of **Sodium Iodide** daily. They think it may be that the vitamins promote assimilation of iodine or regulate calcium metabolism, or that they control the secreting function described by Williamson and Pearse. (See also **FOOD AND THE PUBLIC HEALTH**.)

TREATMENT.—F. R. Fraser,<sup>25</sup> in discussing the statistics at St. Bartholomew's Hospital, concludes that surgical treatment is indicated in: (1) Practically all cases of secondary Graves' disease; and (2) In primary cases which do not improve rapidly or which continue to relapse and become chronically ill, or in which for financial or other reasons adequate and prolonged medical treatment is not feasible.

I. Bram<sup>26</sup> puts in a strong plea for medical treatment. On the strength of 2000 cases he maintains that with rest under suitable environment, plenty of food apart from meat, the salts of quinine, mild sedatives, ovarian and suprarenal extracts, and psychotherapy, 90 per cent regained perfect health, and that the average time away from customary duties was fifteen weeks. He concludes that the factors militating against successful medical treatment have been the administration of thyroid extract (which is obviously wrong), injudicious use of iodides and digitalis, and a deficient study of the individual as a whole, with a consequent spirit of haste manifested by the average medical attendant. Brilliant as the results of operation have been in suitable cases, one realizes that this does not reach the underlying cause but only breaks the vicious circle. Therefore our attitude to early and thorough medical treatment should be sympathetic.

W. H. C. Romanis,<sup>27</sup> while commending operation in general, advises against it in children under 15 in whom the disease occasionally occurs, and in patients where all the signs are present except palpable thyroid enlargement. Here he thinks other glands, especially the pituitary, may be involved. One must, however, bear in mind the evidence as to masked thyrotoxicosis. Y. Noguchi<sup>28</sup> thought that tetany was apt to follow ligation of all four thyroid arteries. He regarded recurrence after operation as usually due to insufficient removal, and only occasionally to a progressive form of the disease.

W. O. Thompson and others<sup>29</sup> hold similar views, and think that it is probably impossible at present to prevent a certain amount of recurrence, short of total thyroidectomy, which is of course to be deprecated. They consider that if the B.M.R. is +15 or higher for from ten to fourteen days after operation, and the patient has been receiving iodine during this period, it is probable that the disease will persist. But if a patient has a normal B.M.R. for two months without iodine, the danger of recurrence is slight. If the gland is easily palpable after operation, thyrotoxicosis is almost always still present. W. O. and P. K. Thompson<sup>30</sup> attribute the temporary œdema of the face which may occur after operation to a hold-up of water in the tissues due to a temporary lack of thyroid secretion during the period of adjustment in the remnant of the gland. In one year 16 per cent of the cases treated by operation or by X rays developed this symptom. It could hardly be due to true myxœdema, since the B.M.R. was usually normal.

Several writers have recently been urging against tonsillectomy before partial thyroidectomy (see Bartlett<sup>31</sup>). One would hesitate, however, before accepting this statement as of general application. Tonsillar sepsis is often an important factor in causing thyrotoxicosis, and the reviewer has seen removal of the tonsils in young patients produce such improvement that no operation on the thyroid was required.

It may be said finally that treatment by irradiation is not gaining in popularity. Van den Wildenberg<sup>32</sup> and H. M. Richter<sup>33</sup> both criticize unfavourably much of the literature advocating **Radiotherapy**; even the advocates admit 30 to 50 per cent failures. C. Sutton,<sup>34</sup> on the other hand, is inclined to advocate medical treatment combined with radiotherapy, while A. Soiland and others<sup>35</sup> maintain that the results of radiotherapy compare favourably with the results of surgery. R. B. Graham, who is a strong advocate of

operation, nevertheless regards X rays as less risky than operation for patients under 20.

**Views of the French Schools.**—At the Twenty-first French Congress of Medicine, which was held at Liège in September, 1930, the question of hyperthyroidism was discussed at some length.<sup>30</sup> Marcel Labbé proposed the following classification:—

1. *Basedow's syndrome*—or the classical picture of Graves' disease.
2. *Goitres with hyperthyroidism* in which there are no signs, or hardly any, of sympathetic disturbance, but in which the basal metabolic rate is appreciably raised.
3. *'Syndrome parabasadoëzien'*—purely a disturbance of the sympathetic nervous system without any participation on the part of the thyroid.

Studying the interactions between the anterior lobe of the pituitary and the thyroid, Labbé came to the conclusion that the secretion of the former led to excretion of all the colloid from the latter, with alterations in the cells lining the vesicles. After repeated injections of the anterior pituitary hormone there was a considerable increase in the weight of the thyroid, and a diminution in the volume of the thymus.

L. Dautrebande, recalling the recent work on the chemical structure of thyroxin, and the increase in the bulk of the thyroid when its iodine content fell to half its normal amount of 0.2 per cent, stated that the iodine content of the gland fell proportionately to the hyperplasia of the gland. He maintained that in hyperthyroidism there was no alteration in nitrogenous metabolism, the whole of the increased metabolism arising from the carbohydrates.

Bérard and Peycelon stated that the distinction drawn between the effect of iodine in primary Graves' disease and toxic adenomata was not justified, and that any bad results were merely due to faulty dosage. At the same time they regard its beneficial action as only transitory, and as a preliminary to operation.

Hoet made the interesting observation that in animals in a state of experimental hyperthyroidism, the glycogen completely disappeared from the cardiac muscle, to which fact he attributed the cardiac complications of Graves' disease.

In protesting against indiscriminate administration of iodine for goitres of all kinds, Roch maintained that in districts where goitre is endemic, it was easy to produce typical hyperthyroidism in this way.

REFERENCES.—<sup>1</sup>*Amer. Jour. Med. Sci.* 1931, Jan., 74; <sup>2</sup>*Ibid.* 1930, Dec., 767; <sup>3</sup>*Practitioner*, 1930, Dec., 684; <sup>4</sup>*Brit. Med. Jour.* 1931, ii, 937; <sup>5</sup>*Surg. Gynecol. and Obst.* 1931, Jan., 43; <sup>6</sup>*New Eng. Jour. Med.* 1931, April 9, 747; <sup>7</sup>*Amer. Jour. Surg.* 1929, Aug., 174; <sup>8</sup>*Amer. Jour. Med. Sci.* 1931, May, 681; <sup>9</sup>*Ann. of Surg.* 1930, Sept., 321; <sup>10</sup>*New Eng. Jour. Med.* 1930, Dec. 25, 1274; <sup>11</sup>*Jour. Amer. Med. Assoc.* 1930, June 20, 2050; <sup>12</sup>*Ibid.* June 14, 1891; <sup>13</sup>*Amer. Jour. Med. Sci.* 1930, Sept., 405; <sup>14</sup>*Med. Jour. and Record*, 1931, May 20, 487; <sup>15</sup>*Canad. Med. Assoc. Jour.* 1930, Nov., 645; <sup>16</sup>*Lancet*, 1931, i, 1287; <sup>17</sup>*Ibid.* 1373; <sup>18</sup>*Surg. Gynecol. and Obst.* 1930, Nov., 379 (abstracts); <sup>19</sup>*New Eng. Jour. Med.* 1930, Aug. 14, 327; <sup>20</sup>*Amer. Jour. Med. Sci.* 1931, Jan., 65; <sup>21</sup>*Canad. Med. Assoc. Jour.* 1930, Sept., 349; <sup>22</sup>*Arch. of Internal Med.* 1930, 261 and 420; <sup>23</sup>*Amer. Jour. Surg.* 1929, Aug., 157; <sup>24</sup>*Canad. Med. Assoc. Jour.* 1929, Aug., 153; <sup>25</sup>*Brit. Med. Jour.* 1930, ii, 811; <sup>26</sup>*Med. Jour. and Record*, 1929, Sept. 4, 248; <sup>27</sup>*Lancet*, 1929, ii, 113; <sup>28</sup>*Rev. de Chir.* 1929, 538; <sup>29</sup>*Arch. of Internal Med.* 1930, Dec., 946; <sup>30</sup>*Amer. Jour. Med. Sci.* 1929, July, 73; <sup>31</sup>*Amer. Jour. Surg.* 1921, Aug., 160; <sup>32</sup>*Le Scalpel*, 1929, Sept. 28, No. 39; <sup>33</sup>*Amer. Jour. Surg.* 1930, July, 115; <sup>34</sup>*Ibid.* 118; <sup>35</sup>*Ibid.* 123; <sup>36</sup>*Presse méd.* 1930, Oct. 15, 1395.

#### **HYPERTHYROIDISM, THE HEART IN.** A. G. Gibson, M.D., F.R.C.P.

From a study of the anatomy of the hearts of patients who had died from hyperthyroidism, D. M. McEachan and D. Raiké<sup>1</sup> find that of 27 patients there was cardiac hypertrophy in 16. In 8 instances there was moderate perivascular or intramuscular fibrosis or small round-cell infiltration. While these

facts indicate anatomical change in the cardiac muscle the authors emphasize that it is impossible to ascribe the cardiac phenomena of the disease to structural change in the muscle. It is more probably due to metabolic and functional alterations of the myocardium.

R. S. Morris<sup>2</sup> refers to the cases of thyroid heart with low basal metabolic rate. He joins issue with Levine, who in a recent article asserted that hyperthyroidism can be dismissed if the basal metabolic rate is within normal limits. Morris finds that this is not so, that on clinical and therapeutic grounds thyroïdal cardiac disease can be recognized as occurring in patients with a normal or even a diminished basal metabolic rate. The identification of hyperthyroidism as a cause of cardiac insufficiency in the absence of some of the classical signs is a matter of considerable difficulty, but it is important that these cases should be identified in view of the beneficial effects of **Thyroidectomy**. Some of the more important points are a transient auricular fibrillation, over-action of the heart, loud cardiac sounds, and a failure to obtain the usual reduction in pulse-rate by the use of digitalis. Other slight signs are of assistance: the warm, moist, hyperæmic, and slightly pigmented skin, the greater comfort in cold than in warm weather, attacks of diarrhœa and vomiting, loss of weight, mental alertness and quick movements, and transient glycosuria. In some of these patients a clear history of some thyroïdal complaint may be elicited. The pulse-pressure is usually high and the systolic blood-pressure may exceed 200 mm. of mercury. Three case reports are given, in all of which subtotal thyroidectomy was performed. The basal metabolic rate in all three was below normal and was only diminished slightly from the effect of the operation.

J. Hoskin,<sup>3</sup> in treating of the operative risk in hyperthyroidism, shows that the percentage mortality of all types of Graves' disease without auricular fibrillation is 4.9, whereas with auricular fibrillation it is 11.5. If the hyperthyroidism is subdivided into exophthalmic goitre and toxic goitre, then exophthalmic goitre without auricular fibrillation has the lowest percentage mortality, while the disease with auricular fibrillation has the highest.

After a very careful study of the size of the heart in goitre, L. M. Hurxthal, O. J. Menard, and M. E. Bogan<sup>4</sup> conclude that there is no clear relationship between the duration of the disease or loss of weight and the size of the heart. In the cases they examined the cardiac size as determined by X rays showed a relation to the age rather than to the goitre, and they conclude that hyperthyroidism if it causes hypertrophy or dilatation only does so to a slight extent. Theoretically the overactivity of the heart over a long period ought to produce a hypertrophy, and on the other hand the heart ought to share in a small degree in the general wasting of hyperthyroidism. They have not been able to confirm that cardiac enlargement is due to tracheal stenosis.

REFERENCES.—<sup>1</sup>*Bull. Johns Hopkins Hosp.* 1931, May, 273; <sup>2</sup>*Amer. Jour. Med. Sci.* 1931, March, 297; <sup>3</sup>*Brit. Med. Jour.* 1930, ii, 138; <sup>4</sup>*Amer. Jour. Med. Sci.* 1930, Dec., 772.

**HYPOCHLORHYDRIA IN CHILDREN.** (See ALLERGY IN CHILDREN; ASTHMA.)

**HYSTERECTOMY, VAGINAL.** *Beckwith Whitehouse, M.S., F.R.C.S.*

Extirpation of the uterus and adnexa by the vaginal route is perhaps not practised to-day so commonly as a decade or two ago. The reasons for this are various, but without doubt one of the factors is the easier technique afforded by the abdominal route of approach to the pelvic organs. All the same, vaginal hysterectomy in suitable cases offers many advantages, one of outstanding importance being the small amount of shock and the rapid

convalescence associated with the operation. When occasion arises to remove the uterus in a debilitated or anæmic woman, especially if she happens to be an elderly multipara, excision per vaginam may well be the operation of choice, provided that the organ is not too large or too adherent to neighbouring viscera.

Difficulty in performing the operation usually occurs from lack of mobility of the uterus caused by widespread adhesions associated with chronic inflammatory disease of the adnexa, and therefore impaired mobility. Another troublesome feature may be the exposure and incision of the peritoneum of the anterior pouch between the bladder and uterus.

P. Werner,<sup>1</sup> of Vienna, has introduced an important variation in the technique of vaginal hysterectomy which goes far to remove these difficulties, and which will be appreciated by those pelvic surgeons who favour the vaginal route. The essential feature of Werner's operation is bisection of the uterus in the middle line from below, and removal of each half of the uterus separately. After the patient is placed in the lithotomy position the vagina is thoroughly exposed and the cervix seized with tenacula, one to each lip. A transverse incision is made through the anterior vaginal fornix and the bladder loosened from the anterior wall of the cervix. The bladder is then retracted and the anterior wall of the cervix split with scissors as high as the vesical attachment. When the bladder has been entirely separated, the incision is carried up through the cervix in the mid-line until the peritoneum is opened. A retractor is then introduced through the aperture in the peritoneum, and the uterine incision carried up to the fundus. At this stage the organ can usually be delivered, and the bisection is completed by carrying the incision from the fundus through the posterior wall to the posterior lip of the cervix. Bleeding up to this stage is negligible as the larger vessels have not been divided and the mid-line of the uterus is relatively an anæmic field of operation. One half of the uterus is replaced into the peritoneal cavity and the other half then pulled well downwards to bring into view the corresponding appendage. The infundibulo-pelvic, round, broad, and utero-sacral ligaments are divided between clamps after separation of adhesions, and the half of the uterus with its ovary and Fallopian tube is extirpated. Clamps are removed after ligation of the various ligaments with catgut, and the same procedure is carried out with the remaining half of the uterus. The cut peritoneal edge both in front and behind is then sutured to the vaginal margin, and if any oozing from adhesions remains, a strip of iodoform gauze is placed loosely in the peritoneal cavity and drawn through the vagina. There is no necessity to close the vaginal incision, as the intestines do not prolapse.

The steps of this very useful modification of a valuable operation are clearly indicated in *Plates XXVI-XXVIII*.

REFERENCE.—<sup>1</sup>*Surg. Gynecol. and Obst.* 1931, Feb., 233.

**IMPETIGO CONTAGIOSA.** (*See SKIN, STREPTOCOCCAL INFECTIONS OF.*)

### **IMPOTENCE.**

*Kenneth Walker, O.B.E., F.R.C.S.*

During the last year the subject of male impotence has been dealt with by both genito-urinary surgeons and neurologists. Max Hühner<sup>1</sup> describes the organic changes found in the posterior urethra in cases of male impotence and speaks favourably of prolonged treatment by **Prostatic Massage** combined with posterior instillations of **Silver Nitrate**. K. Walker,<sup>2</sup> while admitting that the changes described by Hühner are frequently present and that when present they respond to the above line of treatment, states that in the great majority of his own patients no objective signs existed. Whilst, therefore, he is in agreement as to the paramount importance of making a searching

# PLATE XXVI

## VAGINAL HYSTERECTOMY

(T. WERNER)

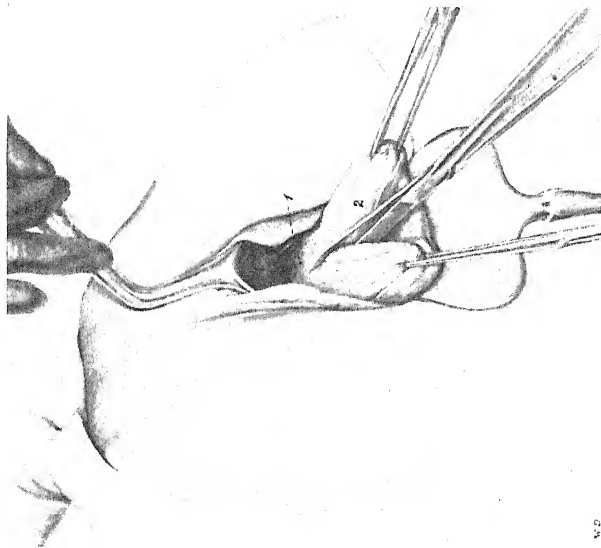


Fig. A.—1, Exposed anterior uterine wall; 2, Cut surface of cervix and anterior uterine wall.

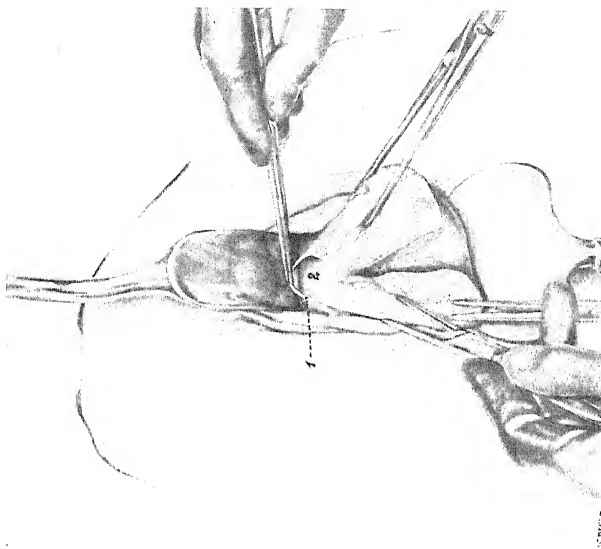


Fig. B.—1, Peritoneal edge; 2, Split cervix.

Plates XXVI-XXVIII by kind permission of  
'Surgery, Gynecology and Obstetrics'

# PLATE XXVII

## VAGINAL HYSTERECTOMY—continued

(P. WEINER)

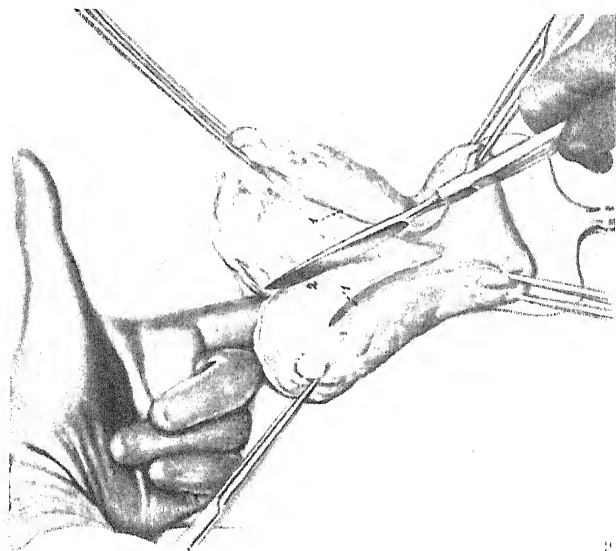


Fig. C.—1, Uterine cavity; 4, Posterior wall of the uterus.

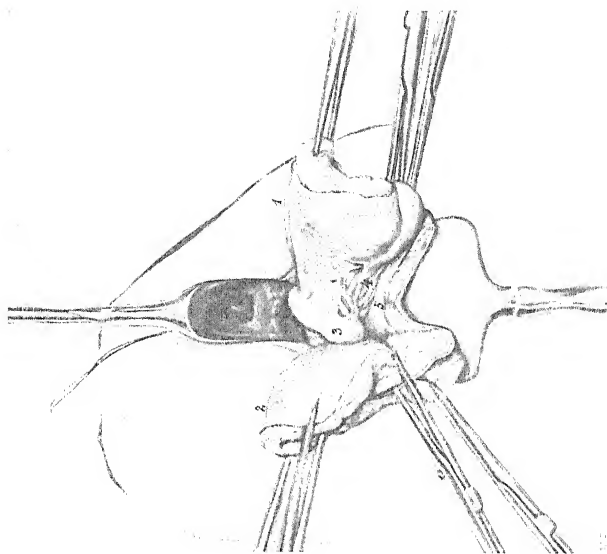


Fig. D.—3, Left half of the uterus; 2, Right half of the uterus; 3, Left tube; 4, Adhesions; 5, Peritoneal covering of Douglas's pouch.



# PLATE XXVIII

## VAGINAL HYSTERECTOMY—continued

(P. WEENER)

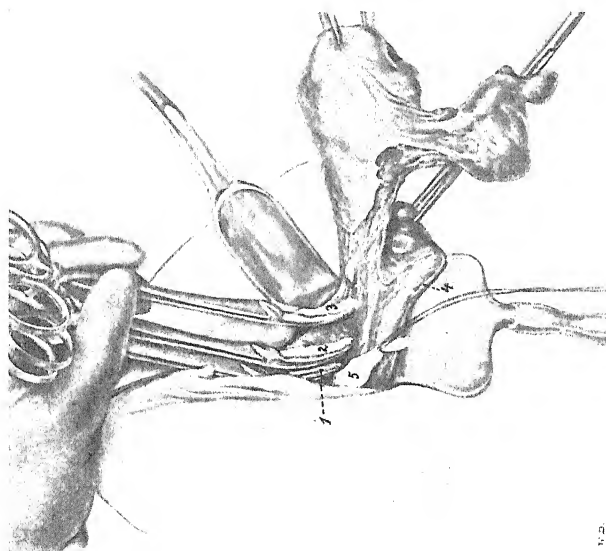


Fig. E.—1, Infundibulopelvic ligament; 2, Broad ligament; 3, Uterosacral ligament; 4, Posterior wall of the vagina; 5, Gauze pack.

N. 2.

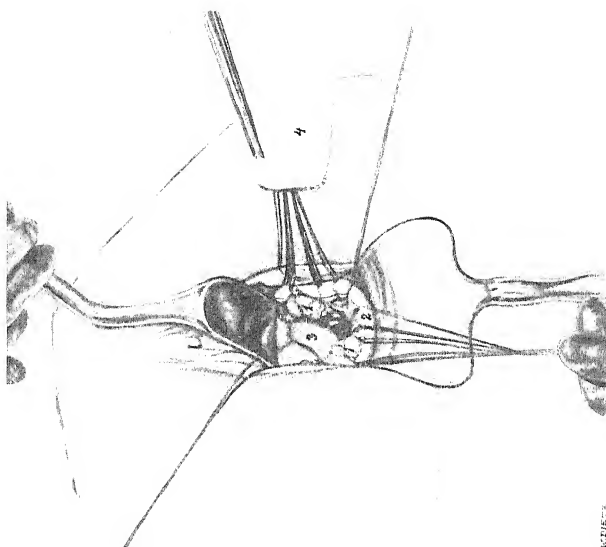


Fig. F.—1, Stumps; 2, Posterior vaginal wall and peritoneum; 3, Bowels; 4, Gauze.

N. 2.



examination of the patient's genital tract he is inclined to lay stress on the psychological rather than on the physical side of treatment.

W. R. Reynell,<sup>3</sup> writing on the subject of sexual neuroses from the point of view of neurology, states that much may be done to improve the condition of the impotent man by attention to both the physical and the mental side of his trouble. He calls attention to the fact that inheritance plays an important part in determining the strength of sexual desire. When the sexual impulse is weak it will frequently be found that it was equally weak in the patient's parents. He considers that the main cause of primary impotence is weakness of the sexual impulse. Repression may of course be a factor, and when the initial impulse is small the coexistence of repression results in complete impotence. Treatment depends on the cause of the impotence. Unfortunately a common factor contributing to inability to complete the sexual act is a marital misfit, and as this can rarely be remedied no cure can be expected whilst the man remains married to that particular wife. A common example of this type of case was the gentle sensitive man who was wedded to an aggressive wife. Such wives were often the daughters of inferior alcoholic or degenerate fathers who had grown up without a father ideal. They learnt to look on men as belonging to an inferior race and treated their husbands as they had treated their unsuccessful fathers. Occasionally something could be achieved in these cases by enlisting the co-operation of both husband and wife and giving them an insight into the cause of their marital troubles, but as a rule the situation was so delicate as not to admit of solution.

REFERENCES.—<sup>1</sup>*Disorders of the Male Sexual Function*, 1929; <sup>2</sup>*Male Disorders of Sex*, 1930; <sup>3</sup>*Proc. Roy. Soc. Med.* 1931, Feb., 27.

**INDUSTRIAL DISEASES.** (*See also* CORONERS' CASES AND MEDICO-LEGAL WORK; ERYSIPELOID; PNEUMONOCOINOSIS.)

G. E. Oates, M.D., M.R.C.P., D.P.H.

**Occupational Diseases of Hop-pickers.**—B. M. Smithies,<sup>1</sup> after extensive experience of hop-pickers, describes three affections as being peculiar to this occupation. Hop rash or dermatitis recurs in the same individual year after year. A papular erythema occurs on the exposed surfaces accompanied by intense irritation. In the worst cases there is headache and irresistible drowsiness. The papular stage may rapidly become vesicular and then pustular. Associated with the dermatitis are invariably a number of small scratches from the hop vines. The condition quickly subsides when the source of irritation—that is, the hops—is removed. Hop eye comes on rapidly after the eyes have been rubbed with fingers dirty from hop-picking. This oedematous conjunctivitis, like the dermatitis, is probably due to protein irritation in a sensitive person. Hop gout occurs in adults and runs as short a course as the allied rash and conjunctivitis. It may occur in the fingers, hand, wrist, or forearm, and is unilateral. The swelling is red and tense, and on palpation a typical fine crepitation is felt like the crunching of crisp snow. The sufferers are never affected in this way except in the hop-picking season.

**The Health of Chromium Plating Workers.**—H. B. Trumper,<sup>2</sup> who is Medical Officer to the Association of British Chromium Depositors, discusses the risks incidental to chromium plating. The disablement, usually temporary, resulting from exposure to chromic acid or its salts, takes the forms of: (1) Dermatitis; (2) Ulceration of the hands, arms, or feet; (3) Ulceration of the cartilaginous part of the septum of the nose; (4) Vomiting after food. During the process of plating, reddish-brown fumes rise up from the strong solution of chromic acid employed, and are sucked off by exhaust fans. These fumes contain upwards of 60 per cent of chromic acid, forced up in the form of a

spray by the evolution of hydrogen at the cathode. The dust evolved in the polishing of the plate is also a source of danger, but not to such an extent. Disablement among the operators on a chromium plating plant can be prevented, the essential points being the elimination of septic foci, such as foul teeth or tonsils. These conditions render a worker quite unsuitable for the industry. The skin and nostrils should be protected by ointment. The floors of the plating shop should be dry and the exhaust apparatus efficient. Persons suffering from chromium dermatitis or ulceration should have efficient treatment on the earliest signs appearing, and they need not as a rule cease work. Women are very susceptible and should not be employed except in the polishing shops. There is no evidence of the systemic poisoning of workers in this industry.

**The Suspension and Compensation of Workers Suffering from Silicosis.**—The procedure differs from that applicable to other industrial diseases. A Medical Board (which may act through panels consisting of two or more members) has been constituted for the whole country. The Board is responsible for making examinations and giving certificates in connection with any of the compensation schemes, as affecting living claimants and the representatives of deceased workers. There is no appeal from its decisions.

Workers newly employed in the refractories or sandstone industries as defined or in certain processes of the pottery and asbestos industries must be examined by a member of the Board or a specially appointed medical officer. For this purpose the tuberculosis officers of local authorities have been asked to officiate. If on examination it is found that a worker does not possess a chest of at least average development and respiratory passages free from obstruction, or that he has signs of disease of the lungs or heart or tuberculosis of any region, he must be referred to the Medical Board, who will decide whether he should be suspended from work.

The Board also carries out periodical examinations of workers in the scheduled industries. If, generally speaking, it is found that a worker is suffering from silicosis, asbestosis, or associated tuberculosis to such a degree that it is dangerous for him to continue in the industry, the Board must suspend and certify him. The remuneration of members of the Board and other medical officers is paid from a fund, which is provided out of the fees paid by employers and workers, for the various examinations and certificates. A doctor is not called upon to notify a case of silicosis or asbestosis occurring in his private practice unless he is satisfied on clinical grounds that tuberculosis is also present. The patient may suitably be told to obtain advice as regards his right to compensation.

REFERENCES.—<sup>1</sup>*Lancet*, 1929, ii, 494; <sup>2</sup>*Brit. Med. Jour.* 1931, i, 705.

## INFANTILE DIARRHŒA: THE RÔLE OF AURAL INFECTION IN.

*Reginald Miller, M.D., F.R.C.P.*

D. E. S. Wishart<sup>1</sup> attempts to answer the question, "Is infection of the mastoid the cause of acute intestinal intoxication in infants?" The argument upon which such a suggestion is based is quite intelligible. Many cases of acute infantile diarrhœa resemble much more closely a toxic diarrhœa from some very intense toxæmia or septicæmia than they do a primary infection of the intestine itself. Therefore it is a possibility that the disease is really due to some hidden focus of infection, with the diarrhœa as a secondary result of intense toxæmia. For some years it has been suggested that the primary infection in such cases was in the ears or mastoid antra, and in the present paper we have the results of a team investigation undertaken at the Hospital for Sick Children, Toronto, over a space of five years. A large number of

observations bearing on the condition of the middle ears and antra have been made in cases of acute intestinal intoxication, both before and after death. As a routine the appearance of the tympanic membranes has been watched throughout the course of the disease until death was imminent, and the post-mortem conditions have been carefully correlated with previous observations. It is interesting to note that the pathologist was in some instances satisfied that the middle ears were filled with gastric contents, resulting from the process of vomiting, and the suggestion is made that infection of the ears may be produced in this way more commonly than is recognized. If so, this would clearly be a secondary phenomenon which could be in no causal relationship to the intestinal symptoms. It was also found that there was no correspondence between the bacteriology of the ears and that of the intestine. In spite of the difficulty involved in such a complicated investigation, the staff of the hospital seems to have reached a very important practical conclusion. The author writes: "Our medical staff has now seen so many sufferers from this disease [acute intestinal intoxication] with normal middle ears and mastoid antrums that it refuses to allow the mastoids of infants with acute intestinal intoxication to be operated on unless they exhibit true clinical mastoiditis." Bilateral mastoid operation for the cure of the disease was a failure, and the author's final conclusion is that "infection of the mastoid antrum is not the cause of acute intestinal intoxication in infants."

[Weighing carefully the evidence on which this important paper is based it is easy to agree that ear infection is not the cause of acute intestinal intoxication in infants: but is this the whole question? Is it not rather whether such ear infection can ever be the cause of this disease? Can an infant suffer and die from an acute diarrhoea which is no more than a toxæmic or septicæmic response to acute aural infection? If this is a possibility, it is of importance that this type of exceptional case should be recognized. I have sometimes thought that in a case of acute febrile diarrhoea in a well-nourished infant, paracentesis of the ears, even though the membranes may appear normal on inspection, has been of critical benefit. More often I have seen at post-mortem examination ears that I could have wished had been punctured during life. In the paper under review it is clear that such exceptional cases (if they exist) have not been recognized, and this is in itself an important fact considering the very long and patient investigation whose results are here reported: but I do not think that the author would wish his conclusions to be taken as an altogether final verdict—R. M.]

REFERENCE.—<sup>1</sup>*Jour. Amer. Med. Assoc.* 1930, Oct. 11, 1084.

## INFLUENZA. (See also PYREXIA, CONTINUED.)

J. D. Rolleston, M.D., F.R.C.P.

SYMPTOMS AND COMPLICATIONS.—J. Gibbens,<sup>1</sup> who records two cases of influenzal meningitis in a male infant aged 1 year, who died, and a boy aged 5 years, who recovered, states that the mortality of this condition is 92 per cent. He attributes the recovery of his second case to the early drawing off of the cerebrospinal fluid by lumbar puncture, which was performed ten hours after the apparent onset of meningitis.

E. J. Benjamin<sup>2</sup> reports a case of *influenzal bacteriæmia* in a male infant, aged 8 months, who was suddenly seized with cough, vomiting, and fever, and showed signs of pneumonia in the left lung. *B. influenzae* was found in the blood and in the serous fluid removed from the chest. Nine days after the onset symptoms of meningitis developed and death took place; *B. influenzae* was also found in the cerebrospinal fluid. There is no record of an autopsy.

According to H. Oiseau<sup>3</sup> *polyneuritis* may develop in convalescence from

influenza at periods varying from ten days to two months from the onset of the attack. The polyneuritis is chiefly motor. All four limbs may be involved and sometimes Landry's paralysis may occur. The muscles of the trunk and neck are very rarely affected. Facial paralysis is fairly frequent. Several cases of ocular palsy have been recorded, the third nerve being most commonly affected, while paralysis of accommodation is not frequent. Palatal and pharyngeal palsies are rare. The characteristic features of influenzal polyneuritis are its predilection for the extremities—especially for the extensor muscles—the frequency of electrical changes, and its irregular course. Sensory, trophic, and vasomotor symptoms are ill marked. The sphincters in most cases are unaffected.

J. H. Doggart,<sup>4</sup> who reports two cases in a man, age 47, and a woman, age 58, states that the main features of post-influenzal *acute parenchymatous keratitis* are: (1) It occurs in convalescence; (2) It is unilateral; (3) It is accompanied by iridocyclitis and is prone to relapse; (4) The anterior and middle layers of the substantia propria are chiefly involved, but epithelial erosions may also occur.

J. Bertrand<sup>5</sup> records seven cases of post-influenzal *suppuration of ovarian cysts* in women aged from 35 to 48, five of which are original, while he has found only two others in the literature. He maintains, however, that the condition is less rare than these figures suggest. The suppuration is probably due to the pneumococcus conveyed to the ovary by the blood-stream. Operation is always required, though vaccine treatment may also be of assistance.

REFERENCES.—<sup>1</sup>*Lancet*, 1931, i, 291; <sup>2</sup>*Arch. of Pediatrics*, 1931, 340; <sup>3</sup>*Thèse de Paris*, 1930, No. 483; <sup>4</sup>*Lancet*, 1931, i, 19; <sup>5</sup>*Thèse de Paris*, 1931, No. 368.

## INJECTION TREATMENT OF HYDROCELE, VARICOCELE, BURSE, AND NÆVI.

Sir W. I. de C. Wheeler, F.R.C.S.I.

**Hydrocele** (see also HYDROCELE IN CHILDREN).—

A. E. Porritt<sup>1</sup> gives the following method of treatment: The patient lies down on a couch or table, and after the skin over the selected spot (according to the situation of the testicle) has been sterilized, a small, local infiltration anæsthetic (2 per cent novocain, with adrenalin) is given, and this is considered to be of particular value in that it not only makes the procedure painless, but also avoids any possible maldirection of the aspirating needle, due to involuntary movements on the part of the patient. Further, the adrenalin serves to stop any slight venous oozing that may occur. The hydrocele is now aspirated and completely emptied. The sac is then washed out once or twice with sterile water. The sclerosing solution is injected through a cannula by means of a hypodermic syringe and needle. The average dose is 4 to 5 c.c. of 5 per cent **Sodium Morrhuate**. The cannula is withdrawn and a collodion dressing applied, after which the scrotum is gently massaged for two or three minutes. Usually the patient returns in a week for a second tapping, but there is very little fluid. As a general rule the scrotum has completely returned to normal within three months.

**Varicocele**.—Treatment by injection is practically always successful. The method used is to have the patient standing, with a good light. A little local anæsthetic is injected. The great difficulty in the procedure is to fix one of the very mobile venous radicles while inserting the needle. The injection is made at the level of the pubis or just below, and from above down. The bunch of veins and overlying skin is steadied between finger and thumb while the injection is being made from above downwards. After the injection the patient lies down for a few minutes to obviate any leakage. The dose used is 2 c.c. of 5 per cent **Sodium Morrhuate**. The injection may be repeated within

a week or ten days. The reaction is often intense, but the result is never in doubt.

**Bursæ.**—The injection treatment is not applicable if the bursæ is in communication with a joint, but it is suitable in cases of prepatellar and olecranon bursæ. The technique is the same as that employed in hydrocele. Murphy used a **Formalin-Glycerin Solution** in 1915 in a case of subacromial bursitis. [The 20 per cent formalin-glycerin solution was used by Murphy more as an antiseptic than as a sclerosing agent.—W. I. de C. W.]

**Nævi.**—It is possible with a very fine needle to inject into the lumen of the underlying vein, but even in the purely capillary type injections repeated at different points at the base of the nævus will, almost without exception, produce cures. The great advantage of the treatment is that it leaves no scar.

REFERENCE.—<sup>1</sup>*Proc. Roy. Soc. Med.* 1931, May, 971.

### INTESTINAL OBSTRUCTION.

*A. Rendle Short, M.D., F.R.C.S.*

A large number of papers have appeared during the year dealing in a general way with this subject, but as they all say the same thing, and that not for the first time, we may sum them up in a few words. They emphasize the importance of the chloride-reduction and high non-protein nitrogen figures in the blood, and the value of intravenous injections of hypertonic sodium chloride. They stress the need for early operation, and the usefulness of a high enterostomy if it is unsafe to remove the cause of the obstruction at once. Most of the writers prefer a local or spinal anæsthesia.

**DIAGNOSIS.**—O. H. Wangenstein and R. O. Goehl,<sup>1</sup> of Minneapolis, emphasize the fact that the ability of the bowel to expel an enema, with a certain amount of gas, and faecal matter if present, by no means disproves the existence of an intestinal obstruction higher up. Valuable aid in diagnosis may be afforded by X rays, without barium. The patient should be standing. Gaseous distension of the coils of bowel, and multiple fluid levels due to stagnant intestinal contents, are very characteristic. Papers, with illustrations, are published on the subject by M. H. Rabwin and R. A. Carter,<sup>2</sup> of Los Angeles, and by A. Ochsner and A. Granger,<sup>3</sup> of New Orleans (*Plate XXIX*).

**Chlorides in Intestinal Obstruction.**—J. C. Armour, T. G. Brown, D. M. Dunlop, T. C. Mitchell, H. H. Searls, and C. P. Stewart,<sup>4</sup> of Edinburgh, as the result of experiments on dogs, conclude that the administration of chlorides and water below an obstruction will prolong life for a month; if peptone and sugar are added, for seven weeks. There is no increase of *B. welchii* in the stomachs of obstructed animals. Apparently the loss of chlorides and water is the main cause of death.

A. Gosset and D. Petit-Dutailis<sup>5</sup> sum up the experience of many surgeons, after a discussion in Paris, in favour of the administration of intravenous injections of hypertonic saline as a life-saving measure. T. G. Orr, P. N. Johnstone, and R. L. Haden<sup>6</sup> believe that it acts by replacing the chlorides lost, is an active factor in the water-distribution of the body, stimulates peristalsis, and improves the tone of intestinal muscle.

**Enterostomy.**—G. H. Stobie<sup>7</sup> gives some details of the method of performing this operation. A local anæsthetic reinforced by gas-oxygen is best. A distended loop of small intestine, well above the paralysed coils, is emptied by milking, perforated, and a No. 10 catheter passed in a few inches, pointing downwards, and fixed by a purse-string suture of chromicized catgut or silk. [Silk is better.—A. R. S.] The intestine is then folded over the catheter for 1½ in. and sewn over as in Witzel's operation. A piece of omentum is interposed between the bowel and the abdominal wall, and the catheter brought through a hole in it. A few stitches hold the intestine and omentum to the

abdominal wall. The catheter is best brought out through a stab-wound, to avoid fouling of the main incision, and left in place a week or more. It pulls out easily, and the orifice closes itself.

G. Hosemann,<sup>8</sup> of Freiburg, has had favourable experience of the method in really dangerous cases. He gives the following table of results :—

OPERATION	No. OF CASES	RECOVERED	DIED
Appendicostomy ..	17	15	2
Cæcostomy ..	16	10	6
Enterostomy ..	29	8	21
Total ..	62	33	29

**Drainage of the Stomach.**—In cases of mechanical obstruction or of purely paralytic ileus, when incessant vomiting is present or expected, drainage of the

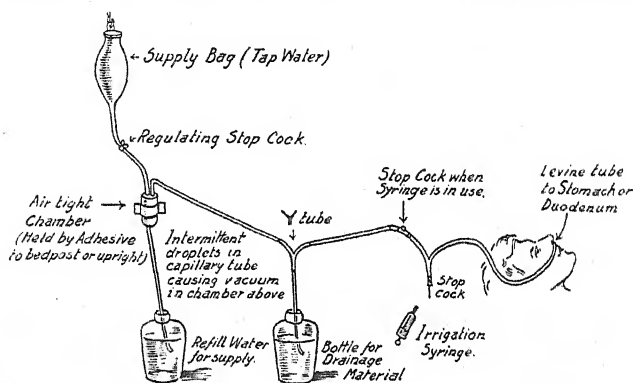


Fig. 59.—Connell suction apparatus. (Re-drawn from 'Annals of Surgery'.)

stomach is often more effectual than an enterostomy. It may be obtained by passing a Kappis tube through the nose into the stomach, and leaving it *in situ* for several days to siphon off gas and fluids. (See also APPENDICITIS.) This method is explained and advocated by C. E. Jancke,<sup>9</sup> of Hanover.

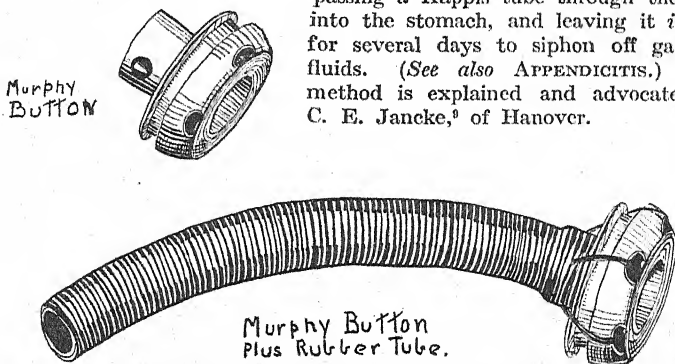


Fig. 60.—Sullivan's treatment of intestinal obstruction. The rubber tube and Murphy button. (Figs. 60 and 61 by kind permission of 'Annals of Surgery'.)



E. Heller,<sup>10</sup> of Leipzig, whilst using the nasal tube for 'dauer-drainage' of the stomach, thinks it better in the severer cases to make a temporary gastrostomy. These patients with ileus often suffer from intolerable thirst, and

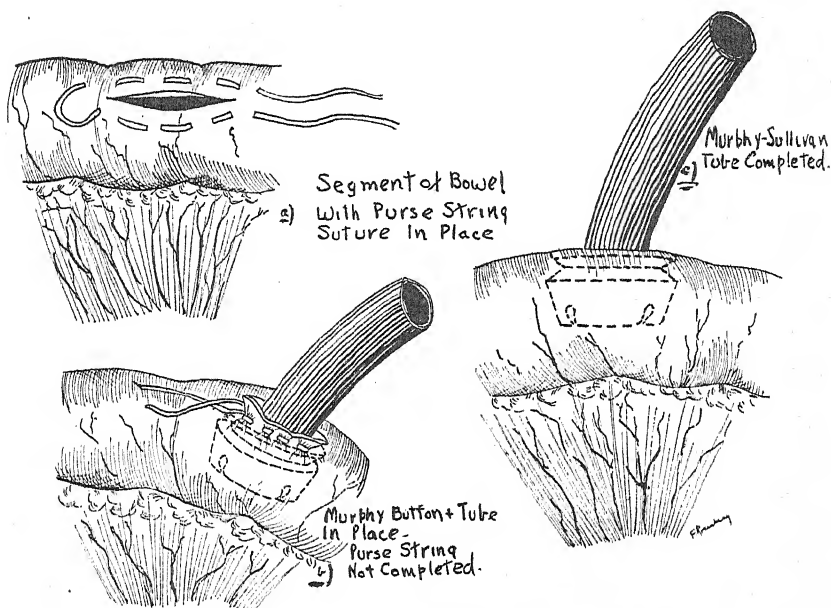


Fig. 61.—Sullivan's treatment of intestinal obstruction. Steps of the operation.

continuous intravenous infusion ('dauertröpfinfusion') combined with gastrostomy is a great help.

L. Antupit and D. F. Sullivan,<sup>11</sup> of Hartford, Connecticut, use a Levine tube passed through the nose into the stomach, and attach a continuous suction apparatus (Connell's), worked on the Sprengel pump system (Fig. 59).

**Operative Methods.**—Antupit and Sullivan perform multiple enterostomy and colostomy by inserting three or four Murphy buttons into the bowel, attaching a rubber tube to each, and bringing them out through the abdominal wall (Figs. 60–62).

J. W. Vaughan,<sup>12</sup> of Detroit, Michigan, prefers a short-circuiting operation, usually ileocolostomy, to enterostomy whenever possible. He quotes a run of six successful cases, after having lost several with enterostomy. [Unfortunately, there is often pelvic obstruction, which puts entero-anastomosis out of court. In our experience in such cases of obstruction, an end-to-side anastomosis works well, but a side-to-side junction often fails.—A. R. S.].

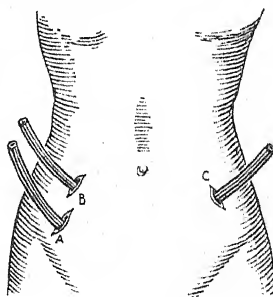


Fig. 62.—Murphy-Sullivan tubes in place. Abdomen closed. Points of usual obstruction: A, Appendical; B, Hepatic; C, Sigmoid. (Re-drawn from 'Annals of Surgery'.)

H. Jansen,<sup>13</sup> of Smolensk, Russia, describes and illustrates some rather heroic measures for the exclusion of diseased bowel by resection and anastomosis. For instance, he sometimes brings the transverse colon down to the pelvic colon for a side-to-end union, and exteriorizes the excluded portion of the colon by bringing the cut end of the pelvic colon to the surface.

REFERENCES.—<sup>1</sup>*Arch. of Internal. Med.* 1930, Oct., 669; <sup>2</sup>*Calif. and Western Med.* 1930, July, 483; <sup>3</sup>*Ann. of Surg.* 1930, Nov., 947; <sup>4</sup>*Brit. Jour. Surg.* 1931, Jan., 467; <sup>5</sup>*Bull. et Mém. Soc. de Chir.* 1930, Nov., 1291; <sup>6</sup>*Surg. Gynecol. and Obst.* 1931, May, 941; <sup>7</sup>*Canad. Med. Assoc. Jour.* 1931, Jan., 70; <sup>8</sup>*Deut. Zeits. f. Chir.* 1931, May, 345; <sup>9</sup>*Zentralb. f. Chir.* 1930, Aug., 1971; <sup>10</sup>*Arch. f. klin. Chir.* 1930, Feb., 286; <sup>11</sup>*Ann. of Surg.* 1930, Aug., 270; <sup>12</sup>*Ibid.* Oct., 704; <sup>13</sup>*Arch. f. klin. Chir.* 1931, March, 614.

## INTESTINAL WORMS. (See WORMS, INTESTINAL.)

### INTESTINES, SURGERY OF.

A. Rendle Short, M.D., F.R.C.S.

Adhesions of the small intestine, according to H. W. Soper and J. W. Thompson,<sup>1</sup> can often be shown by barium skiagraphy. The dilated coils of ileum are very suggestive. If operation is decided upon, "spinal anaesthesia is of extreme importance", as it relaxes the intestines. After separating the adherent coils, omentum is interposed between them and the abdominal wall. For seventy-two hours, no food or water is given by mouth; intravenous saline and glucose are freely administered; a Levin tube passed into the stomach through the nose is used to prevent vomiting; no enema is allowed, and no purgative. Morphia is given every four to six hours. The purpose of all this is to eliminate peristalsis.

F. J. Morrin,<sup>2</sup> of Dublin, has had three cases of perforation of primary ulcers of the jejunum in adults, one of which recovered after operation. He has found records of 84 cases of perforated ulcer of the small intestine in the literature. In 4 patients, the perforation recurred. There were 27 recoveries. Evidently in a case of peritonitis of obscure origin, the small intestine ought to be searched. Unfortunately, the ulcer may be anywhere in the jejunum or ileum.

REFERENCES.—<sup>1</sup>*Amer. Jour. Surg.* 1930, Aug., 243; <sup>2</sup>*Irish Jour. Med. Sci.* 1931, May, 198.

### INTRATHORACIC NEW GROWTHS.

A. Tudor Edwards, M.Ch., F.R.C.S.

The number of recorded cases of intrathoracic new growth, both benign and malignant, is increasing enormously, and this is largely due to more careful investigation of patients with symptoms referable to the chest. Of the various methods of investigation the premier place is unquestionably held by radiology, and its value in all obscure chest disease is widely recognized. The result of earlier diagnosis is that many of the intrathoracic tumours can be submitted to surgical measures with resultant cure or amelioration.

W. Denk<sup>1</sup> reports a series of cases of intrathoracic new growths, dividing them up into: (1) Tumours of the bony wall; (2) Tumours of the lung, (a) cysts, (b) parasitic cysts, (c) malignant tumours—sarcoma and carcinoma; (3) Mediastinal tumours—the benign being dermoids and teratomata and tumours of the sympathetic system, and the malignant, sarcoma and carcinoma. Group 1: three cases all successfully removed, but one, a sarcoma, died three years later from recurrence. Group 2a: a cyst of doubtful origin adjoining the pericardium was enucleated. In Group 2b two patients were operated upon, with one death and one recovery. Denk, in summing up the indications for operation in hydatid disease of the lung, shows that the weight of evidence is against operative interference in the central cysts. Group 2c comprised

# PLATE XXIX

## DIAGNOSIS OF INTESTINAL OBSTRUCTION

(A. OCHSNER and A. GRANGER)

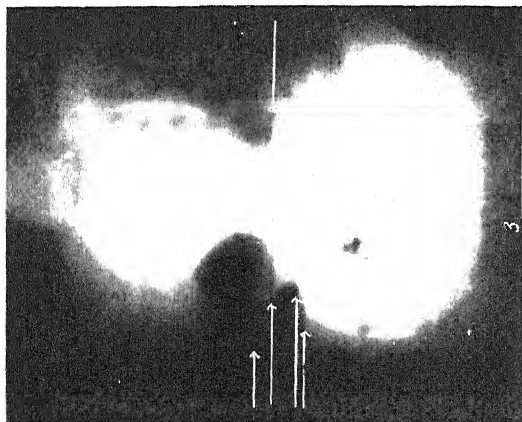


Fig. A.

Fig. A.—Plain roentgenogram of patient aged seventy years. For twenty years patient has had a hernia. Thirty hours previous to admission to hospital was taken suddenly with severe pain in the abdomen associated with vomiting. Pain centered in epigastrium and shows the presence of fluid levels in both sides of the abdomen. At operation an obstruction in the region of the sigmoid flexure of the colon was found. There is some increase in the gas content in the small gut. At operation an obstruction in the region of the sigmoid flexure of the colon was found.

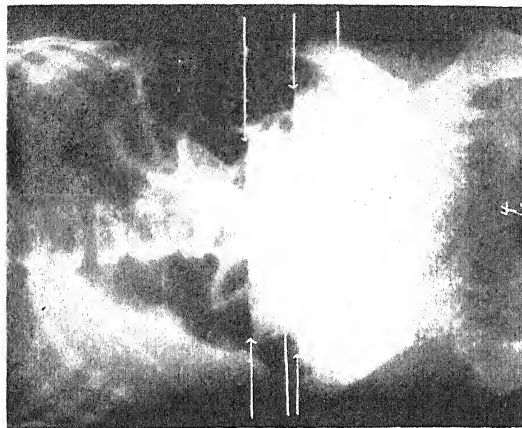


Fig. B.

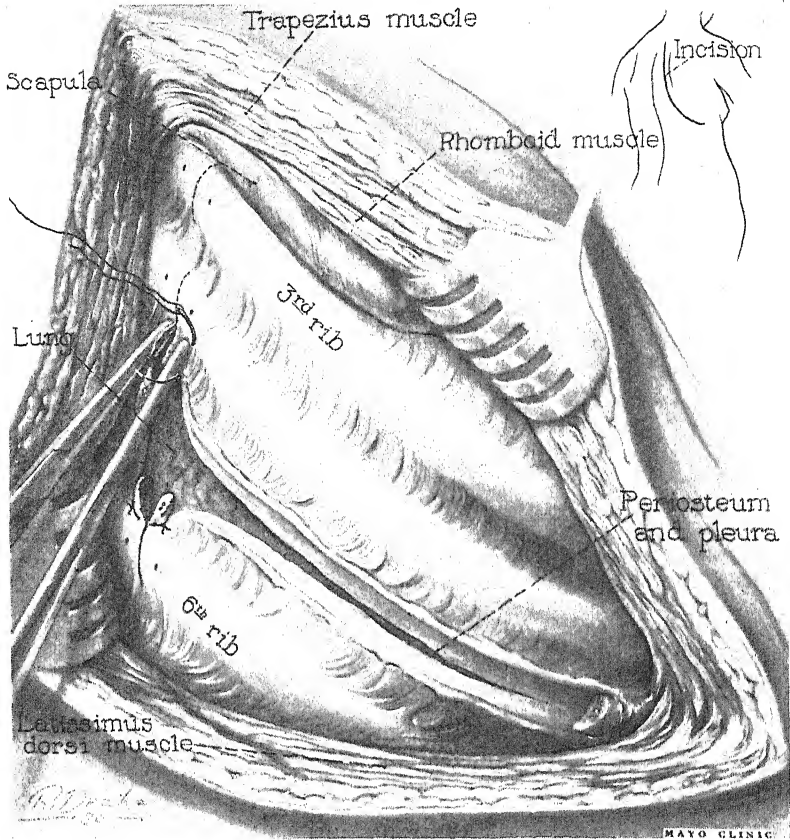
Fig. B.—Plain roentgenogram of the abdomen of a patient aged six years, who two days prior to admission to the hospital, was awakened suddenly with pain in the abdomen near the umbilicus. Patient vomited and had been obstipated since. Abdomen distended. Roentgenograms taken with the patient in the upright position show marked dilatation of the loops of the intestine with parallel transversely coursing loops of bowel in the upper left portion of the abdomen. Two of these loops show typical serrated outlines. There are numerous fluid levels present in various portions of the abdomen. At autopsy an enterolith at about the junction of the jejunum with the ileum was found producing complete obstruction.

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# PLATE XXX

## THORACOTOMY FOR INTRATHORACIC NEUROFIBROMA

(S. W. HARRINGTON)



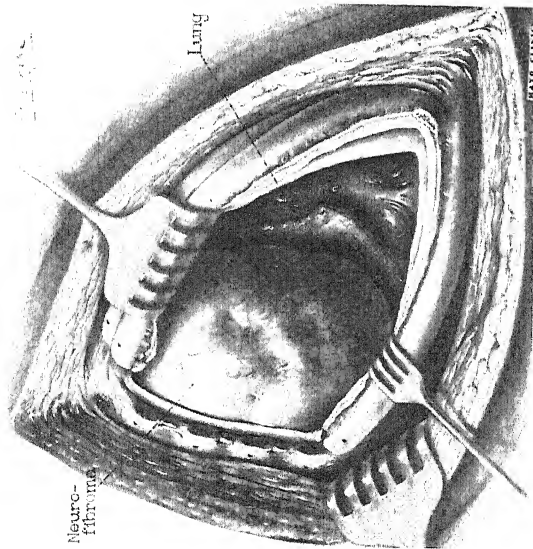
*Fig. 1.*—Posterolateral incision along the vertebral border of the scapula and laterally along the seventh rib showing incision through the soft tissues of the thoracic wall and into the pleural cavity, with partial resection of the fifth rib. Intercostal vessels cut between ligatures, and ribs drilled for reconstruction before the necessary ribs to increase the exposure are sectioned. The inset shows the site of incision.

*Plates XXX-XXXII by kind permission of  
'Surgery, Gynecology and Obstetrics'*

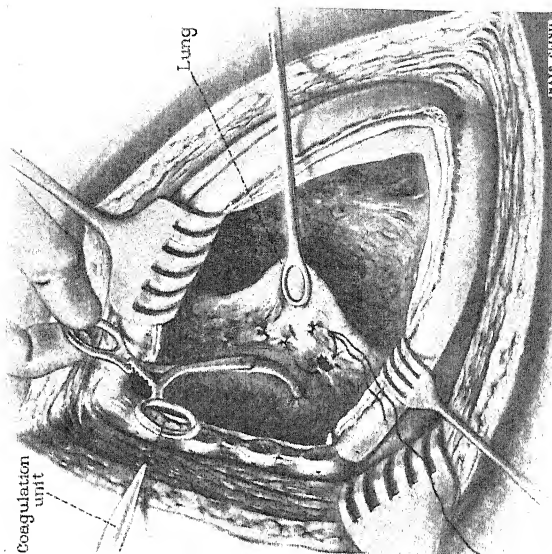
# PLATE XXXI

## THORACOTOMY FOR INTRATHORACIC NEUROFIBROMA—continued

(S. W. HARRINGTON)



*Fig. B.*—Large posterior thoracic and mediastinal neurofibroma after complete dissection of the adherent lung from the surface. Lung adherent to the parietal pleura.

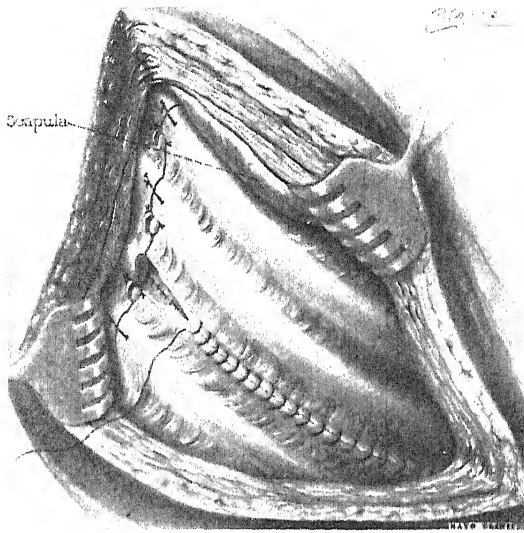


*Fig. C.*—Large cavity resulting from complete removal of the large posterior thoracic and mediastinal tumour. Lung partially collapsed. Repair of many areas of injury to the lung, and using coagulation cautery for control of multiple bleeding points deep in the posterior mediastinum and on the surface of the lung.

PLATE XXXII

THORACOTOMY FOR INTRATHORACIC NEUROFIBROMA—*continued*

(S. W. HARRINGTON)



*Fig. D.*—Complete reconstruction of the thoracic wall after removal of a large posterior mediastinal tumour by transpleural operation. Ribs sutured with catgut. Muscles of thoracic wall closed in layers, and thoracic cavity closed without drainage.

cases of lung sarcoma, in two of which removal was attempted, one dying soon after operation and the other from recurrence ten weeks later. The third was explored and found to be a sarcoma of the hilum glands into the lung. In the lung carcinoma, partial removal was carried out in two patients, one of whom died within eighteen months, and the other, operated upon in three stages, died fourteen days after the last stage from acute pericarditis. In the mediastinal tumours one dermoid and one sympathetic nerve tumour were successfully extirpated. An attempt to remove a carcinoma of the thymus was fatal.

In a paper on malignant disease of the lung A. Tudor Edwards<sup>2</sup> gives an account of the symptoms and signs, and states that diagnosis depends upon adequate X-ray examination, bronchoscopy, occasionally thoracoscopy, and, finally, exploratory thoracotomy. The treatment is divided into two groups: (1) that of the central growths, and (2) that of the bronchial growths. In the former, radical operative interference is advised wherever possible, and in those which are inoperable the insertion of **Radon Seeds** by open operation is advised. Three cases in which radical operation was carried out are recorded. In cases of bronchial carcinoma, which are much more common than the first group, operation is only rarely possible, but one case of successful removal of a carcinoma from the left upper lobe bronchus is recorded. Generally, the use of radon seeds is indicated for this type of growth. It is carried out by means of the insertion of special radon-seed containers which can be passed through a bronchoscope. This container is retained from five to eight days and then removed. Results in three cases are recorded. The result of deep X-ray therapy for primary malignant lung tumours has been disappointing. With regard to secondary deposits, they are commonly multiple and often bilateral. Rarely when a single secondary deposit is present operative treatment is indicated. Record of such a case is given, the patient still being alive three years after the operation.

S. W. Harrington<sup>3</sup> gives the results of operation in 24 cases of intrathoracic new growths. He states that there are no characteristic symptoms by which early malignant lesions can be distinguished from early benign lesions. Pain is the predominant symptom for which the patient seeks relief, and is usually more severe in the malignant lesions. In 3 cases of apical malignant tumour Horner's syndrome was present. Dyspnoea was more marked in anterior mediastinal tumours than in those arising in other situations. The value of careful X-ray examination is stressed, and screen examination advocated in all cases. Lipiodol injection is often a considerable aid in distinguishing between intrapulmonary and extrapulmonary lesions.

In 8 cases anterior or lateral **Thoracotomy** was done over the site of the tumour, in 16 the posterior approach was used (*Plates XXX-XXXII*). In 4 cases, all malignant, the tumours were only partially removed. One-stage operation is advisable where the condition of the patient permits. Two operative deaths resulted, on the second and on the seventh day respectively after operation. The benign tumours removed consisted of 4 neurofibromas, 2 cellular fibromas, 4 teratomas, 1 osteochondroma, and 1 fibromyxochondroma—a total of 12 cases. The malignant tumours comprised 6 cases of sarcoma of varied type, 2 endotheliomas, 3 adenocarcinomas, and 1 squamous-celled carcinoma (secondary malignant changes in a teratoma).

H. P. Nelson,<sup>4</sup> following anatomical investigation into the various groups of the tracheal bronchial glands and their involvement in carcinoma of the bronchi, advocates their treatment by **Radium**. This followed the experimental insertion of radon seeds through the bronchial wall in patients who had died of malignant disease of the bronchus. The operation was carried

out in two living patients by passing a bronchoscope and introducing the seeds into the glands through the bronchial wall. One of these patients survived, and one died within three weeks. In neither case did mediastinal complications develop.

E. Ranzi<sup>5</sup> and P. Walzel<sup>6</sup> record respectively a case each of tumours arising in the costovertebral angle from nerve tissue probably in the sympathetic nerve system—ganglioneuroma. In Ranzi's case there was complete relief of symptoms and recovery of the patient. In Walzel's case the patient died from operation undertaken eleven months later and required to close the residual cavity.

REFERENCES.—<sup>1</sup>*Surg. Gynecol. and Obst.* 1930, Nov., 647; <sup>2</sup>*Brit. Med. Jour.* 1931, i, 129; <sup>3</sup>*Surg. Gynecol. and Obst.* 1930, Nov., 647; <sup>4</sup>*Lancet*, 1930, ii, 1118; <sup>5</sup>*Wien. klin. Woch.* 1931, June 26, 840; <sup>6</sup>*Arch. f. klin. Chir.* 1931, March, 626.

### INTUSSUSCEPTION.

John Fraser, Ch.M., F.R.C.S.Ed.

When an intussusception reaches the stage of irreducibility the surgeon is faced with a distressing problem. Immediate resection results in a forbidding mortality, and an artificial anus is often but a temporary means of relief.

Treves suggested that the likelihood of spontaneous recovery by elimination of the gangrenous 'intussusception' was greater than one suspected, but that there were few bold enough to put the matter to the test. A. H. Montgomery and J. J. Mussi<sup>1</sup> have afforded proof of Treves's contention. They report two cases in which an irreducible intussusception was left *in situ*, the invagination being 'fixed' by a row of interrupted silk sutures about the neck, while a lateral anastomosis between the ileum and distal colon short-circuited the affected segment. The patients were children aged 7 months and 8 months respectively, and in neither case was any massive slough of bowel extruded in the post-operative period. The authors have put the matter to experimental

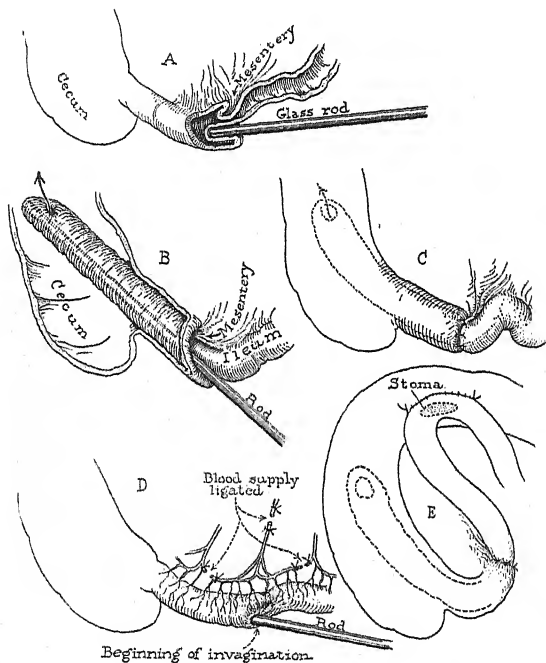


Fig. 63.—Experimental intussusception treated by circular retaining suture and lateral anastomosis. (By kind permission of 'Surgery, Gynecology and Obstetrics'.)

test in a series of dogs (Fig. 63), and come to the conclusion that "Lateral anastomosis of ileum to cæcum around the intussuscepted portion of bowel will permit normal function of the remainder of the bowel, with no disturbance to the general health of the dog."



H. Fruchard and A. Peignaux<sup>2</sup> report 6 cases of intussusception in infants treated by **Barium Enema** controlled by X-ray examination. In 2 cases complete reduction ensued, in 4 the X-ray examination showed that the reduction was not complete, and operative interference was required. The authors point out the various advantages of the procedure.

A somewhat similar argument is embodied in a paper by A. Pouliquen.<sup>3</sup> He records 11 cases treated by barium enema combined with open exploration of the right iliac fossa. His argument is that the reduction of the intussusception proceeds up to the ileocaecal junction, but that at this point in some cases the reduction is arrested. In order to exclude this possibility, he exposes the ileocaecal junction through a gridiron muscle-splitting incision, and, if any invagination persists, reduces it. He points out that an operation of this type is infinitely less serious than the mid-line incision and the eviscerating procedure in the completely unreduced case. There was one death in the series.

REFERENCES.—<sup>1</sup>*Surg. Gynecol. and Obst.* 1930, Sept., 415; <sup>2</sup>*Bull. et Mém. Soc. de Chir.* 1931, Feb. 7, 95; <sup>3</sup>*Ibid.* May 16, 674.

### JAMAICA GINGER ('JAKE') PARALYSIS.

*Macdonald Critchley, M.D., F.R.C.P.*

During the spring and early summer of 1930 a severe and unusual type of polyneuritis became prevalent throughout the United States, especially in Ohio, Kentucky, Alabama, Mississippi, and Massachusetts. At the height of the epidemic there were probably 500 cases in the Cincinnati district, and 300 cases were reported in Oklahoma City alone over a period of two months. A close etiological association was discoverable between the onset of symptoms and the drinking of commercial extract of Jamaica ginger. This preparation, commonly known as 'jake' or 'jakey', is put up in 2-oz. bottles and sold throughout America—less because of its claim as an intestinal sedative than for its notoriously high content of alcohol. An inexpensive medicament containing as much as 80 to 90 per cent of pure alcohol could not fail to become popular in the States as a basis of various beverages.

Shortly after drinking Jamaica ginger a certain number of persons became afflicted with a rapidly-progressive paralysis of the extremities. Incubation times varied from four days to three weeks. Premonitory symptoms of a febrile or dyspeptic character were occasionally described. Weakness appeared in the legs and later in the arms, leading in the course of a few hours to a powerlessness of the extensors of feet and wrists. At times complaint was made of some degree of pain, cramps, and numbness. Examination revealed a polyneuritis, mainly motor in type, with flaccidity and wasting of muscles and absence of the tendon reflexes. Objective sensory changes were slight or absent. No sphincter disorder occurred, and there was no affection of the cranial nerves. Occasionally trophic changes appeared, such as desquamation of the palms or soles, and œdema of the ankles. Spinal-fluid alterations included an increase in the globulin and abnormalities in the colloidal gold curve. A proportion of the cases terminated fatally through ascending paralysis and bulbar involvement. The majority remained more or less stationary over the course of six months. Autopsy findings, as described by H. Jeter,<sup>1</sup> C. A. Turley,<sup>2</sup> and R. H. Goodall and M. B. Humphries,<sup>3</sup> include proliferative changes in the cerebrospinal meninges and thickening of the perineurium, especially of the nerves and nerve-roots of the lower extremities. The anterior tibial nerve seems to be especially vulnerable. Parenchymatous degenerative changes are also found within the nerve-trunks, the anterior horn cells of the spinal cord, and the medullary nuclei.

The etiology of the Jamaica ginger paralysis was at first uncertain. Although large amounts of alcohol had been imbibed by many of the patients afflicted, it seemed unlikely that all the symptoms could be ascribed to alcoholic polyneuritis. The quantity of fluid ingested did not seem of great importance, as serious paralysis quite often followed a single drink. Metallic contaminants, such as arsenic and lead, were early suspected, but soon ruled out. It is now known that a chemical adulterant—*triorthocresol phosphate*—is the agent responsible for 'Jake' paralysis. M. I. Smith,<sup>4</sup> of the United States Public Health Service, has produced typical paralysis in monkeys and calves by means of this substance. Triorthocresol, being a cheaper preparation, had evidently been substituted in certain brands for the natural ginger, with resulting disaster to the consumers.

REFERENCES.—<sup>1</sup>*Jour. Amer. Med. Assoc.* 1930, xcv, 112; <sup>2</sup>*Oklahoma Med. Assoc.* 1930, June 23, 193; <sup>3</sup>*Jour. Amer. Med. Assoc.* 1931, xcvi, 14; <sup>4</sup>*Pub. Health Rep.* 1930, xlv, 1703.

### JAUNDICE, ACHOLURIC (Hæmolytic Icterus).

Stanley Davidson, M.D., F.R.C.P.E.

In the Hume Lectures, Lord Dawson,<sup>1</sup> after reviewing the origin of bile-pigment and the part played by the reticulo-endothelial system in pigment metabolism, passes on to the consideration of hæmolytic icterus in a study based on 40 cases. It is of considerable interest to note that 5 of the cases specially under review had normal blood fragility to hypotonic saline, and that in Gänsslen's reported series of cases of acholuric jaundice 10 per cent had no increase of fragility. In short, Lord Dawson considers that fragility is a factor, not an essential feature, of the disease. Another interesting point is that in some of the cases the colour index was unity or over, and a megaloblastic blood picture was present in contradistinction to the generally accepted text-book description of a low colour index microcytic anæmia.

*Complications.*—Forty per cent of the patients were known to have biliary-tract affections. There were 12 fatal cases in the series, and of these only 1 followed splenectomy. In contrast, of 14 patients treated with **Splenectomy**, only 1 died; this was a surgical mishap. Of the 12 fatal cases, 8 died of hæmolytic anæmia and 2 of cholangitis complicated by anæmia. The importance, therefore, of the operation of splenectomy in avoiding this fatal acute hæmolytic anæmia is well demonstrated.

[The classical symptoms on which the diagnosis of familial acholuric jaundice depends are the family history, the fragility of the red cells, microcytosis, a hypochromic anæmia, and splenomegaly. If a case with a high colour index, megaloblastic blood picture, and no fragility can be placed in this category, the differential diagnosis between pernicious anæmia and the acute hæmolytic anæmias associated with certain types of Hodgkin's disease, etc. (see HODGKIN'S DISEASE) becomes of great difficulty and uncertainty. It is admitted by the reviewer that the hypotonic saline test is merely a rough laboratory method for demonstrating artificially some inherent defect in the erythrocyte which may be quite independent of fragility. It still remains, however, the only available method for demonstrating that some unknown abnormality exists. It appears to be advisable, therefore, to retain the name 'familial acholuric jaundice' for the cases with the classical symptoms mentioned above, and to classify anæmias of the hæmolytic type without fragility of the erythrocyte under some general term such as acute or chronic hæmolytic anæmia until further knowledge accumulates.—S. D.]

REFERENCE.—<sup>1</sup>*Brit. Med. Jour.* 1931, i, 921, 963.

**JAUNDICE, INFECTIVE.***J. D. Rolleston, M.D., F.R.C.P.*

**EPIDEMIOLOGY.**—J. A. Glover and J. Wilson<sup>1</sup> report an epidemic of jaundice which is one of the most extensive that has occurred in England, and the first known to attack a large public school. The epidemic began with sporadic cases both in school and town in March, 1930. There was definite epidemic prevalence in the last fortnight of May, and the disease continued epidemic throughout June and July, ending in the second week of August with a few atypical cases of tonsillitis. The type of the disease was uniformly mild, and no complications were observed. The patients were mostly children or adolescents, but young adults formed about 20 per cent of the total. The evidence suggested that transmission was by nasopharyngeal droplet infection and was favoured by intimate contact, especially in sleeping quarters. Possibly some cases were due to infection by swimming-bath water. Bacteriological examination of the urine and throat in a few cases was negative.

**SYMPTOMS AND COMPLICATIONS.**—V. de Lavergne and R. Lévy<sup>2</sup> show that the duration of the incubation period of spirochaetosis icterohæmorrhagica in man varies according as it is contracted from water or is of surgical origin (see *MEDICAL ANNUAL*, 1930, p. 299). In the former case the incubation period averages about 5 days, and rarely exceeds 10 days, while in the latter it is about 15 days and is almost always more than 10 days. The writers attribute this difference to the duration of the incubation period being due to the number and virulence of the infective organisms. In the case of water infection a much larger number of organisms is introduced into the system than by any other mode of penetration.

Meersseman, Friess, and Courmel<sup>3</sup> state that several examples of spirochaetosis icterohæmorrhagica without jaundice have been reported since Goebel, followed by Costa and Troisier, first described the condition in 1916. Two forms of anicteric spirochaetosis may be distinguished, one being a meningeal, and the other a myalgic form. The writers' case, which occurred in a man aged 21, was an example of the meningeal form. The symptoms, which developed about a week after he had been wading in a river, consisted of myalgia, epistaxis, and a meningeal syndrome. Direct examination of the urine was negative, but inoculation of it into a guinea-pig produced typical spirochaetosis icterohæmorrhagica. The patient recovered. Seven other cases of meningeal spirochaetosis in patients, aged from 14 to 36, have been collected by S. Schwartz,<sup>4</sup> who states that the symptoms suggestive of the condition are a sudden onset, naso-labial herpes, and intense conjunctivo-ciliary congestion, with a slight meningeal syndrome. Recovery may be uninterrupted or there may be one or more recurrences of the meningeal symptoms. The prognosis, however, is always favourable. Probably many cases of abortive meningitis will be found to be of spirochaetal origin.

**REFERENCES.**—<sup>1</sup>*Lancet*, 1931, i, 722; <sup>2</sup>*Presse méd.* 1931, 651; <sup>3</sup>*Monde méd.* 1931, 680; <sup>4</sup>*Thèse de Paris*, 1931, No. 192.

**JOINT ANKYLOSIS.***E. W. Hey Groves, M.S., F.R.C.S.**S. J. H. Griffiths, F.R.C.S.*

**Treatment by Parathyroidectomy.**—Oppel, in 1926, showed that a large number of cases of polyarthritides which, without any known etiological cause went on to ankylosis, had hypercalcaemia. Since the parathyroid controls calcium metabolism, he quite rightly drew the inference that there must be some relation between the ankylosing process, the hypercalcaemia, and the parathyroids. He submitted 55 cases to unilateral parathyroidectomy, and the immediate results for the most part were striking and the late results favourable.

R. Leriche and A. Jung<sup>1</sup> have published a most interesting paper dealing with this problem of the treatment of ankylosing polyarthritis by parathyroidectomy. Ankylosing polyarthritis is a disease occurring frequently in young people. In a matter of a few months it runs a painful course to a definite crippledom, and against it we are powerless. We would all admit that the hydropathic treatments or the various medicaments have scarcely any real value even as sedatives, and the disease pursues its relentless course no matter what we do. We therefore welcome with interest the observations of so great an authority as Leriche. As with many new researches, Oppel's work has been met with little response, and coming as it does from a Russian surgeon it has produced considerable scepticism. Leriche, as a true student and seeker of the truth, has gone out of his way to collect cases suffering from this condition, and in two years he has collected twenty-two cases, and as the result of studying these he has come to certain conclusions:—

1. Ankylosing polyarthritis is a syndrome whose anatomical morphology is peculiar to itself whatever the origin of the disease.

2. In a certain number of these cases there is a raised blood-calcium.

3. In the hypercalcaemic cases, the removal of one or more parathyroids has a sure and definite effect which ought to be studied.

4. Considering the rapidity with which ankylosis occurs, i.e., a resulting lesion for which nothing can be done, a parathyroidectomy operation becomes one of urgency and should be performed as soon as the condition of hypercalcaemia has been established and before any actual bone change has occurred.

5. This calls for a blood-calcium estimation in all polyarthritides in whom no infective origin is apparent and whose disease is running an apyrexial course, and, if there is any notable excess of calcium in the blood serum, this immediate operation should be decided upon. It is only in this way that we can tell whether parathyroidectomy can arrest the ankylosing process, and we should not, as in the past, consider the disease incurable until we have probed the possibilities of parathyroidectomy.

Surgical research has long established the fact that in the formation of callus the blood-calcium is not altered and that the repair of a fracture is purely a local calcium change. So with most pathological ossifications the same holds good. As long as the parathyroid mechanism remains normal the blood-calcium content remains constant.

M. P. Weil and C. O. Guillaumin<sup>2</sup> found that there was no change in the calcium content of the blood in arthritis, whether of traumatic, infectious, gonococcal, or tuberculous origin, and no constant change in arthritis deformans. In all these the calcium change remains a local process and the pathological change takes place according to the biological reactions. The authors summarize as follows:—

1. The skeleton has a calcium reserve by means of which the organism maintains a constant blood-calcium.

2. Any hyperaemic process in the neighbourhood of the skeleton is accompanied by a local liberation of calcium without this being taken up by the blood, and if the accompanying local conditions are favourable, it is deposited on the spot, resulting in ossification. Hyperaemia leads first to decalcification and then to ossification, and there is only a local interchange of calcium; it is thus that ankylosis takes place in an infective arthritis.

3. Decalcification processes may be either general or local; the general are the result of hyperparathyroidism, and in these cases there is a hypercalcaemia, and this hypercalcaemia indicates parathyroid disturbance.

Many workers have estimated the blood-calcium in arthritis, but since most of the results are contradictory, it is impossible to come to any definite conclusion.

Oppel noted the frequency of hypercalcaemia in polyarticular arthritis and attributed the condition to an infective polyarthrititis occurring in a hyperparathyroid patient, and the resulting hypercalcaemia led to the deposit of calcium and the resulting ankylosis in the inflamed joints.

This dual pathology is difficult to understand, for from what we have already stated an infection may result in ankylosis by the method of hyperaemia, rarefaction, local calcium exchange, and then ossification. What, then, is the very definite result of parathyroidectomy due to? For, as Oppel says, it produces a fall in the blood-calcium, disappearance of pain, and sometimes complete arrest of the disease.

Leriche is of the opinion that Hirtt's method of estimating the blood-calcium, although long and painstaking, is the only method of any real value, and according to this method he finds that the normal figure for the blood-calcium is 0.093 grm. per litre of serum, and any figures between 0.08 and 0.1 are considered as normal. In the cases investigated by Leriche none could admit of an infective origin, and therefore he states that, without prejudice, we must look for a hypercalcaemia in certain cases of arthritis of unknown origin. In three such cases operated upon in Leriche's clinic, parathyroidectomy was performed and they have all improved at least temporarily.

The following account of one of Leriche's cases is of interest:—

A man, age 40, suffered from a polyarticular ankylosis, primarily of the vertebral column, spreading secondarily to all joints. The disease had involved the vertebral column over a period of twelve years and there was ankylosis throughout, but slight movements of the head were possible, and in other joints, knees, wrists, ankles, the disease varied from a slight grating to complete ankylosis. The most recently involved joints were the wrists, which were slightly red, swollen, and very painful on the smallest movement. No etiological cause could be found. The blood-calcium estimated by Hirtt's method on two occasions was 0.127 and 0.116. Leriche removed the right lower parathyroid, which on subsequent examination showed no histological change. The immediate improvement in the patient was striking. There was complete cessation of pain and he was able to move his wrists; the redness and swelling of the joints disappeared; and he could get up unaided, although, of course, his back was ankylosed. The blood-calcium fell to 0.082 grm. Six months later the pain reappeared, movements of the limbs were painful, and the overlying skin was again reddish and swollen. The blood-calcium was found to be 0.1. The patient was again given intramuscular injections of parathyroid extract, and was relieved for a few hours. At the end of a fortnight the injections of parathyroid failed to give relief and morphia was necessary.

This case, simple and clear at the beginning, was peculiarly complex at the finish.

Another of Leriche's patients, a young man of the spondylitis type with very severe pain, had a parathyroidectomy performed and was able to get up the next day and walk about without pain. He was seen four months after the operation and the improvement was maintained.

There are many types of ankylosing polyarthrititis. In a certain number of cases of unknown etiology and without any infective process, a hypercalcaemia is found, and it appears that in these cases great benefit is derived by removing one or more parathyroids. The operation is a difficult one and the normal parathyroid most difficult to identify, its outer aspect, colour, consistency, or position giving no help. In such cases the method of Loin is of great value. He follows the inferior thyroid artery to the point where it crosses the recurrent laryngeal nerve on the posterior surface of the lateral lobe of the thyroid. By no means is it easy to be certain that one has removed the parathyroid, and Leriche advises ligation of the inferior thyroid artery so that the blood-supply

to the gland is cut off and this arterial resection may have the same result as removal of the gland.

Too many points are still unknown and numerous details prove the complexity of the problem; thus it would be imprudent to come to too favourable a conclusion prematurely, but in all cases of apparently incurable polyarticular ankylosis of unknown origin if there is a hypercalcæmia parathyroidectomy is worth considering.

**Unequal Legs.**—E. W. Hey Groves, in a paper entitled "Stature and Pose",<sup>3</sup> discusses at some length the problem of unequal legs. There are four common groups of cases: (1) Those resulting from malunion of fractures; (2) Those that are the result of faulty ankylosis of the hip after infective arthritis; (3) Those due to poliomyelitis; and (4) Those caused by congenital dislocation of the hip. Prevention is better than cure, and probably more than half the cases of gross deformity in the lower limb with resultant shortening could have been prevented by timely treatment. There is now universal recognition of skeletal traction in fracture surgery, and with this recognition there is no excuse for gross shortening or malunion of fractures of the lower limb. The remark about prevention being better than cure holds good for the various forms of arthritis of the hip, and the timely application of an abduction frame with constant and careful observation will prevent many cases of ankylosis in a faulty position of adduction with its resultant functional shortening, maybe of four to six inches. This type of deformity may very largely be corrected by the Lorenz bifurcation **Osteotomy**. At least two inches are gained by a subtrochanteric osteotomy of this type. (1) The abduction will produce functional lengthening which will counteract the real shortening. (2) The weight of the body will be pressing direct on the femur. (*Plates XXXIII, XXXIV.*)

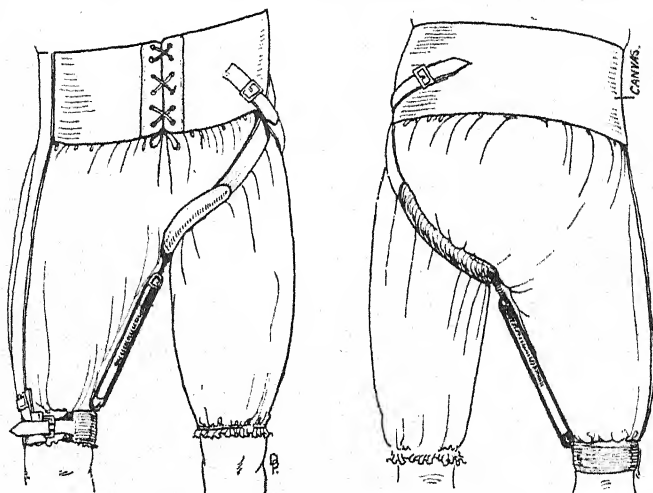


Fig. 64.—Ambulatory abduction splint to be worn for six months after bifurcation osteotomy. (By kind permission of the 'British Medical Journal'.)

**Technique of the Bifurcation Osteotomy.**—The femur is cut down upon through an incision over the base of the great trochanter and the bone divided by an oblique saw-cut which runs downwards and backwards. The femur is then

*PLATE XXXIII*

BIFURCATION OSTEOTOMY FOR UNEQUAL LEGS



*Fig. A.*—Neglected tuberculous disease in childhood, showing destruction of head of femur, and adduction deformity. Functional shortening of leg  $2\frac{1}{2}$  in.

PLATE XXXIV

BIFURCATION OSTEOTOMY FOR UNEQUAL LEGS--*continued*



*Fig B.*—Same case after Loreux bifurcation osteotomy. Abduction of femur and tilting of pelvis bringing limbs same length functionally.



forcibly abducted and the upper end of the shaft pushed towards the symphysis. The limb is then fixed in a plaster spica for three months, following which some form of abduction splint is used. That described appears to be both simple and effective. The illustration (*Fig. 64*) explains itself. The splint prevents the occurrence of adduction which is liable to result from the pull of the adductor group of muscles acting on an incompletely consolidated bone.

The success of the Lorenz bifurcation osteotomy depends upon the fixation of the limb with the correct amount of abduction, and the estimation of this is a real problem. Lovett, in 1888, published a table from which the degree of abduction of a limb can be determined provided the distance between the anterior-superior iliac spines and the difference between the real and apparent shortening were known. A. Adams,<sup>4</sup> of Washington, by a reverse process has used Lovett's table to determine the best functional position in which to place a lower extremity after a hip operation performed for stabilization or a correction of a pre-existing deformity (*see Table I*).

*Table I.*—FOR ESTIMATING THE DEGREE OF LATERAL DISTORTION.

(The figures refer to inches.)

DIFFERENCE BETWEEN REAL AND APPARENT SHORTENING	DISTANCE BETWEEN ANTERIOR-SUPERIOR SPINES														
	3	3½	4	4½	5	5½	6	6½	7	7½	8	8½	9	9½	10
1	5	4	4	3	3	2	2	2	2	2	2	2	2	1	1
1½	10	8	7	6	5	5	4	4	4	4	4	4	4	3	3
2	14	12	11	10	8	8	7	7	6	6	5	5	5	4	4
2½	19	17	14	13	11	10	9	9	8	7	7	6	6	6	5
3	25	21	18	16	14	13	12	11	10	9	9	8	8	7	7
3½	30	25	22	19	17	15	14	13	12	12	11	10	10	9	8
4	36	30	26	23	20	18	17	15	14	13	13	12	11	10	9
4½	42	35	30	26	23	21	19	18	16	15	14	14	13	12	10
5	—	40	34	30	26	24	21	20	19	17	16	15	14	13	12
5½	—	—	40	34	29	27	24	22	21	19	18	17	16	15	14
6	—	—	—	38	32	29	27	25	23	21	20	19	18	17	16
6½	—	—	—	42	35	32	29	27	25	23	22	21	19	18	16
7	—	—	—	—	39	36	32	30	27	26	25	22	21	20	17
7½	—	—	—	—	—	40	35	33	30	28	26	24	23	22	19
8	—	—	—	—	—	—	38	35	32	30	28	26	25	23	20
8½	—	—	—	—	—	—	—	38	35	32	30	28	26	25	23
9	—	—	—	—	—	—	—	—	38	35	32	30	28	26	25
9½	—	—	—	—	—	—	—	—	—	38	35	32	30	28	26
10	—	—	—	—	—	—	—	—	—	—	38	35	32	30	28
11	—	—	—	—	—	—	—	—	—	—	—	38	35	32	30
12	—	—	—	—	—	—	—	—	—	—	—	—	38	35	32
13	—	—	—	—	—	—	—	—	—	—	—	—	—	38	35

To give Adams's example and method: The existing amount of real shortening must first be ascertained, and he advises taking the measurements from the anterior-superior iliac spines to the sole of the foot. If, for example, it has been found that the real shortening is 2 in. and it is decided to gain an apparent lengthening of 1½ in., then, if the distance between the anterior-superior spines measures 8½ in., 10° of abduction would be correct to gain the 1½ in. of apparent lengthening, and the other ½ in. would be obtained by raising the boot; the author finds that patients walk with a better gait with this lift on the boot. Some patients have so much shortening that it cannot be corrected by less than 18° of abduction, and in such cases he advises the deduction of 2 in. in addition to the desired amount of apparent shortening, and resorting to a lengthening operation after the hip has been firmly ankylosed in such position as to compensate for the remaining shortening.

REFERENCES.—<sup>1</sup>*Lyon chir.* 1931; <sup>2</sup>*Proc. Cong. Méd.* 1930 (quoted Leriche); <sup>3</sup>*Brit. Med. Jour.* 1931, July 4; <sup>4</sup>*Surg. Gynecol. and Obst.* 1931, Feb., 261.

**JOINTS, SURGERY OF.** (See JOINT ANKYLOSIS; SACRO-ILIAC AND LUMBO-SACRAL ARTICULATIONS; SHOULDER-JOINT; SPINE; TUBERCULOSIS OF JOINTS.)

**KALA-AZAR.**

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

L. E. Napier<sup>1</sup> records work on the artificial feeding of sand-flies; from this he concludes that both *L. donovani* and *L. tropica* develop equally well in *P. argentipes* in the presence of red corpuscles, but little proliferation occurs in the absence of the latter. In the sand-fly *P. minutes*, *L. donovani* proliferates little if at all. H. E. Short, R. O. A. Smith, and others,<sup>2</sup> report the successful infection of 1 out of 42 hamsters through the bites of infected *P. argentipes* after 511 days, thus completing the proof that sand-flies are carriers of the disease, as indicated by the successful infection of these flies several years ago by R. Knowles, E. E. Napier, and R. O. A. Smith.

The first case of dermal leishmanoid observed in Madras is reported by N. Seshadrinathan. S. L. Sarkar<sup>3</sup> records and illustrates a case of dermal leishmaniasis following kala-azar which was mistaken clinically for leprosy. W. Bensis<sup>4</sup> records an interesting account of kala-azar in Greece, and he points out that the disease is most prevalent where dogs are kept, which are often attacked by kala-azar. He quotes the work of Blanc and Kaminopetros in Athens, who showed that spermophils are easily infected with kala-azar by inoculation and that the parasites can live in the tick, *Rhipicephalus sanguineus*, and animals can be infected by inoculating them with infected ticks, which they regard as a carrier of kala-azar.

TREATMENT.—C. Z. Neumann<sup>5</sup> reports his experience of infantile kala-azar in Malta, where all the cases end fatally if not efficiently treated, and the mortality on the tartar-emetic injections is still 33 per cent; but the use of **Neostibosan** has reduced the death-rate to below 12 per cent, including cases in children of 2 years of age, given daily for ten days in doses of 0.15 grm. intramuscularly without any local irritation. U. Brahmachari and his colleagues<sup>6</sup> report that intravenous injection of 1 per cent finely divided metallic **Antimony** in mice results in the particles being found in the spleen cells, including some containing kala-azar parasites. In a further note<sup>7</sup> they advocate in the treatment of dermal leishmanoid a pentavalent antimonial intravenously combined with inunction of metallic antimony.

REFERENCES.—<sup>1</sup>*Ind. Jour. Med. Research*, 1930, Oct., 699; <sup>2</sup>*Ibid.* 1931, April, 1255; <sup>3</sup>*Ind. Med. Gaz.* 1930, Oct., 572; <sup>4</sup>*Presse méd.* 1931, May 13, 692; <sup>5</sup>*Jour. Trop. Med. and Hyg.* 1930, Nov. 1, 318; <sup>6</sup>*Trans. Roy. Soc. Trop. Med. and Hyg.* Nov. 25, 351; <sup>7</sup>*Ibid.* 1931, March 13, 565.

**KIDNEY.** (See also RENAL DISEASE; PYELITIS AND PYELONEPHRITIS.)

**KIDNEY, SURGERY OF.**

Sir John Thomson-Walker, F.R.C.S.

The relatively small amount of functioning renal tissue that is necessary to maintain good health is now being more appreciated, and many patients with advanced *renal insufficiency*, formerly pronounced incurable, are now being given the benefit of surgical treatment with recovery of renal function. F. Hinman<sup>1</sup> considers that as much as 75 per cent of the total renal mass can be removed and an animal will live in good health. If one kidney is injured, compensatory hypertrophy of the other will be proportional to the extent of the injury. If it be total on one side, the opposite side gets a maximal stimulation. Disease or injury is often localized or circumscribed; under such conditions the uninjured units of the injured side are stimulated equally with the total units of the uninjured side. Renal repair is not only proportional to the ability of repair, but also to the character and permanency of

the demand for repair. The repair in the presence of bilateral injury will be more successful and greater than that of the same degree of unilateral injury, provided the injury is of sufficient severity, because of the greater and more persistent demand.

M. Gerard<sup>2</sup> states that *contusion of the kidney* occurs only once in every 2500 surgical conditions of the kidney. Temporary oliguria followed in a few days by polyuria is the rule, and albumin and casts are commonly found in the urine shortly after injury. The writer notes cases of injury to ectopic, solitary, and horseshoe kidneys. As regards injury to a kidney already the seat of disease, the hydronephrotic kidney is by far the most common to suffer. After enumerating the complications following contusion he states that instrumental pyelography, though contra-indicated in serious cases immediately after injury, appears to give very precise information at a later period when called for on account of persistent hæmaturia or the effects of obstruction. In the future, however, he thinks that intravenous pyelography will be used to ascertain the extent of the renal lesion.

In an article on *injuries to the kidney* E. Dozsa,<sup>3</sup> of Budapest, discusses late results which are of importance in forensic medicine. In regard to traumatic hydronephrosis, symptoms must commence from the time of the injury and be typical of hydronephrosis. In kidney stone care must be taken that a latent stone was not already present at the time of the injury, and it must be known whether the trauma affected a healthy or a diseased kidney. The proof of traumatic stone is a nucleus of blood-clot. When this is not present the symptoms before the formation of the stone, the changes found at operation, and the pathological condition of the kidney will probably but not absolutely certainly show whether the stone results from trauma.

Injury to the kidney does not cause tuberculosis. It is necessary for the tubercle bacillus to be present in the kidney before the trauma. While this is certain, there must also be taken into consideration the kind of injury, the time that has elapsed, and the clinical symptoms. The tuberculous disease must be at the injured site and the signs of injury must be present in the kidney.

The relation between trauma and hypernephroma is very difficult to decide. The most important data which point to the connection are where before the injury no symptoms of growth were present, where immediately after the trauma no tumour was diagnosed, and where between the time of the injury and the discovery of the tumour a definite time has elapsed which would be necessary for the development of the special growth.

G. G. Smith<sup>4</sup> discusses the *plastic surgery of the kidney and ureter*, and states that there are four main causes of obstruction at the uretero-pelvic junction : (1) Narrowing of the ureter just below or at its junction with the renal pelvis ; (2) Valve formation at the uretero-pelvic junction ; (3) Abnormal renal mobility in association with fixation of the upper ureter ; and (4) Obstruction in the uretero-pelvic region due to the presence of aberrant blood-vessels. To deal with these conditions, as diagnosed by complete investigation of the urinary tract, conservative surgical methods are advocated, which should aim at correction of any narrowing of the ureter at its upper end or at its opening into the bladder, obliteration of any valve or spur formation, and the placing of the opening of the ureter at the lowest point of the pelvis of the kidney. Whenever possible efforts to diminish or remove associated infection should precede a plastic operation. The writer discusses fully the various surgical procedures for dealing with the conditions mentioned by conservative means. He considers that in many cases a carefully performed **Nephropexy** will be an important factor in the promotion of a satisfactory result. Seven cases are

reported, 5 of which were completely relieved of their symptoms; in 1 the operation was partially successful; and in 1 the operation was a failure, necessitating a subsequent nephrectomy.

R. P. Rowlands<sup>5</sup> reports 5 cases of *hydronephrosis* due to faulty implantation of the ureter into the renal pelvis with resulting valvular obstruction. Two recovered after uretero-plasty, 1 after Fenger's operation associated with nephropexy, 1 after uretero-pyelo-neostomy, and the fifth case had to be subjected to nephrectomy owing to the extensive disease of the renal parenchyma. Nephrectomy should be avoided, as the condition may be bilateral. Hydronephrosis is often overlooked until the kidney has become seriously damaged by long-continued obstruction with or without superadded septic infection.

R. H. Herbst and W. J. Vynalek<sup>6</sup> describe six cases of *solitary renal cyst*. In association with such a condition a radiological examination may present: (1) A normal pyelogram; (2) Dilatation of the renal pelvis; (3) Compression of the calices or pelvis; (4) A change in the level or axis of the kidney; (5) A shadow of the outline of the cyst itself; (6) Evidence of calcification in the wall of the cyst. A most important and frequent finding is that of the outline of the shadow of the cyst itself in close approximation to that of the kidney and showing a marked increase of density as compared with that of the latter. If the cyst is large enough to cause clinical symptoms, it is often associated with an abnormal pyelographic picture. The writers consider the resection of a wedge-shaped portion of renal tissue, together with the cyst, to be the treatment of choice. After its removal the kidney should be fixed by some method of nephropexy. In cases with severe renal damage, or where carcinoma is suspected, nephrectomy is called for.

M. F. Campbell<sup>7</sup> analyses 83 cases of *perinephric abscess* seen at Bellevue Hospital, New York, during the past ten years; 67 were in males and only 16 in females. The abscess was on the left side in 41 cases, on the right in 40, and bilateral in 2. Nearly half the patients were between the ages of 20 and 40. As regards causation, the intrarenal types include all kinds of infection often associated with injury, stone formation, or tumour, and they nearly always show clinical evidence of involvement of the urinary tract. Perirenal abscess of extrarenal origin is notoriously free of urinary findings or symptoms. Investigation indicates the renal origin, especially cortical or subcapsular, of the majority of perinephric abscesses. In 12 of the writer's cases a perinephric abscess which had penetrated the posterior layer of the renal fascia and entered the pararenal fat extended upwards with the formation of a subphrenic abscess. In 80 per cent of cases infection was due to staphylococci, metastatic from a distant suppurative focus. Next in order of frequency are streptococci and *B. coli*. Pneumococci and gonococci have been recorded as causal agents. Metastatic perinephric abscess may develop during the course of an acute infectious disease, more particularly pneumonia, meningitis, influenza, small-pox, scarlet fever, and typhoid. When secondary to a suppurative focus, such foci are most commonly infected skin lesions, osteomyelitis, respiratory infections, gastro-intestinal lesions, especially appendicitis, and less commonly infections of the genital tract, especially the prostate. Clinical signs are often very indefinite and the diagnosis is difficult. In one-third of the cases under discussion the diagnosis was made only on post-mortem examination. Stereoscopic X-rays are of special value in that they may show obliteration of the shadow of the psoas muscle margin on the side of the abscess, or lateral spinal curvature with the concavity toward the abscess, doubtless due to spasm and rigidity of the psoas and erector spinæ muscles produced by the presence of the inflammatory mass. Further, when extension to the

subphrenic region occurs elevation and fixation of the dome of the diaphragm, together with obliteration of the costophrenic sinus, is diagnostic. Routine urological examination may actually be of no aid. In Campbell's series of 54 cases operated upon, 11 died, and most of these fatalities were directly due to complications rather than to the primary abscess.

T. D. Moore,<sup>8</sup> B. Lipshutz,<sup>9</sup> and J. H. Neff,<sup>10</sup> describe cases of *carbuncle of the kidney*, and review the literature on this condition. They emphasize the importance of an antecedent history of some suppurative lesion, especially of the skin; the difficulties of diagnosis resulting from an obscure clinical picture; and the negative results not uncommonly obtained on examination of the urine. The former two writers advocate immediate **Nephrectomy** as being the treatment of choice except when, at operation, infection is found to be limited to a small area of cortex, when excision may be performed, or in cases complicated by perinephric abscess, when preliminary drainage is desirable prior to nephrectomy. Neff, while recognizing that nephrectomy is the surest and safest form of treatment, has been able to enucleate the abscess in two cases. He considers that this form of treatment will occasionally prove a practical method in preference to excision and, more particularly, to nephrectomy. In any case, when it is found to be feasible he considers it to be the ideal conservative operation.

J. Mombaerts and A. Laroche<sup>11</sup> state that in all cases of *tuberculosis of the epididymis* without apparent involvement of the urinary tract the possibility of a symptomless renal tuberculosis should be borne in mind, and the patient should be kept under observation for a long time. In 145 patients in whom there were no urinary symptoms, in whom the urine was clear, and in whom guinea-pig tests were negative, and who presented merely testicular swelling, tuberculosis of the urinary tract developed later in 28, and **Nephrectomy** was called for in 24.

H. C. Bumpus, jnr., and G. J. Thompson<sup>12</sup> have reviewed the literature published between the years 1920 and 1930 on the subject of *tubercle bacilluria*. Recently they reviewed the ultimate results in cases seen at the Mayo Clinic up to the year 1929 in which guinea-pigs were inoculated with urine obtained before nephrectomy from the kidney which was regarded as normal. Out of 175 such cases, 109 gave negative results, and 43 positive. In 23 the test was a failure. Two of the 43 positive cases died in the hospital, and 11 died subsequently. Of the remaining 30, 13 have undoubted involvement of the remaining kidney, 3 could not be traced, and 14 are apparently well. The urine from 2 of this last group of 14 cases when inoculated into guinea-pigs in the course of re-examination has given negative results. These 14 cases represent either instances of a reflux of infected urine up the ureter of the apparently sound kidney at the time of the examination, or early involvement of the kidney with lesions that have subsequently healed. These authors are of opinion that it is only rarely that tuberculosis of the genital tract can be regarded as the source of tubercle bacilli in the urine. In connection with this last point they have recently reviewed the 606 cases of genital tuberculosis seen at the Mayo Clinic up to 1929. Less than 1 per cent of the series had tubercle bacilli in the urine which they were unable to demonstrate as being of renal origin and which they considered to be of genital origin. They consider, therefore, that the presence of tubercle bacilli in the urine almost always indicates renal involvement. Further, they do not think it possible for a normal kidney to filter tubercle bacilli from the blood-stream into the urine.

Discussing the indications for, and the results of, *conservative operations upon the kidney*, W. Walters<sup>13,14</sup> states that a sufficient number of cases of resection of the renal pelvis for hydronephrosis which have been followed by

a successful result have now been reported to show that such treatment, rather than nephrectomy, is called for in these cases, provided a sufficient amount of normal renal parenchyma remains. He reports the case of a patient examined in June, 1930, in whom he had resected a portion of the right renal pelvis eighteen months previously for hydronephrosis and in whom he had previously performed a similar operation upon the left kidney. This patient is now in good health and showed no evidence of obstruction or infection of the urinary tract. The author finds that renal or ureteral calculi often produce sufficient disturbance of renal function to lead to a wrong assumption that the kidney may be partially or even wholly destroyed. Such disturbance is not necessarily permanent in such cases. Seriously injured kidneys that are the seat of stone formation may show evidence of remarkable restoration of function after such conservative operations as pyelolithotomy. The experience of the Mayo Clinic has been that stones rarely develop again in a kidney which has a satisfactory function, which is being adequately drained, and from which stones have been completely removed.

R. H. Herbst<sup>15</sup> emphasizes the fact that one of the factors in the recurrence of *renal calculi* after operation is the failure to remove all stones or fragments. Even with the greatest care they may be overlooked for the following reasons: (1) On account of their composition they may fail to produce a shadow on films taken in the ordinary way before operation; (2) Two or more stones may be superimposed upon one another, producing a single shadow; (3) During the removal of a stone, especially if an instrument is used for the purpose, one or more small pieces may be broken off and left behind; (4) Shadows seen on X-ray photographs, the true origin of which is not verified with sufficient care, may lead to negative explorations. These sources of fallacy can invariably be avoided by fluoroscopy of the explored kidney, or, better still, by placing a small film behind the delivered kidney and subjecting it to X-ray examination.

R. J. Willan<sup>16</sup> also is greatly in favour of the use of radiography on the exposed kidney as a means of guarding against the recurrence of stone. Furthermore, it is of great value in the detection of the exact site of renal calculus at the time of operation and so preventing the needless sacrifice of renal tissue.

M. Fredet<sup>17</sup> finds, after reviewing 993 cases of infected renal calculi, that there was recurrence in 35 (3.5 per cent). He considers that conservative treatment should be carried out whenever possible, but states that the immediate prognosis of primary nephrectomy is better than that of extended nephrotomy, the mortality in the former being between 8 per cent and 9 per cent, whereas that in the latter is between 13 and 14 per cent. The remote outlook in primary nephrectomy, however, is attended with the risk of possible stone formation on the opposite side.

A. R. Stevens and C. W. Collings,<sup>18</sup> from an experience of 73 cases operated upon for calculous disease of the upper urinary tract (kidney 51, ureter 22), consider **Pyelotomy** to be the operation of choice for renal calculi. There were 8 deaths among the 51 patients operated upon for renal stone, most of which occurred in patients who were desperately ill and demanding emergency treatment. No death followed the 22 ureteral operations. In cases of bilateral renal calculi they operate first, as a general rule, upon that side the treatment of which, in their opinion, will most markedly enhance the total renal function, and they give the following indications for operation: evidence of diminishing renal function, increasing infection, the presence of or the threat of anuria, the presence of ureteral calculus exceeding one centimetre in diameter, and the presence of persistent pain or recurring hæmaturia.

C. B. Mathé<sup>19</sup> reports five cases in which he has removed calculi from a solitary kidney and ureter, and emphasizes the great importance of early

removal of calculi from a solitary kidney or its ureter before the onset of renal insufficiency and advanced infection. When operated upon early, **Lithotomy** in these cases is followed by practically no shock and the operation is tolerated as well as by patients possessing two kidneys. Attempts to facilitate the passage of calculi from the pelvis or ureter of a solitary kidney by cystoscopic manipulations are dangerous owing to the risk of obstructing the ureter. In the presence of chronic pyelonephritis such obstruction is extremely dangerous. Preliminary drainage and lavage of the renal pelvis through a ureteral catheter are of great value in such cases when followed by operation, at which a wide incision assuring good exposure is made, great gentleness in handling the kidney is employed, blood-vessels are not sacrificed, and incisions in the pelvis and ureter are not sutured. A combination of **Pyelolithotomy and Nephrotomy** in certain cases will ensure entire removal of a stone and is less likely to be followed by recurrence. Decapsulation of the kidney should be performed in order to avoid post-operative renal congestion.

W. Walters and W. Wright<sup>20</sup> report 52 cases of operation upon the *solitary kidney and its ureter*. In 45 of the 52 cases the operation was for the removal of urinary calculi. In 34 cases stone was removed from the kidney and in 11 from the ureter. Six patients died after removal of the stone from the kidney, all these being cases in which the operation was undertaken as an emergency procedure, and death occurred as the result of diminished renal function in conjunction with marked renal infection leading to uræmia. These results lead the writers to emphasize the importance of early operation in such cases before the onset of obstruction and its sequelæ. All the patients subjected to **Uretero-lithotomy** recovered.

E. Ljunggren<sup>21</sup> reports 58 cases of *hypernephroma of the kidney*. Early cystoscopic and pyelographic examinations were found to be the most important means of diagnosis. The writer makes a careful statistical study with regard to prognosis. Metastases may occur from seven to ten years after removal of the kidney, and there is no adequate criterion on which to base a prognosis with regard to the duration of life after nephrectomy for renal neoplasm. All cases with metastases to glands or infiltration of the renal fat are very unfavourable. In 39 of the cases reviewed tumour masses were found in the renal vein. Of these, 7 lived for over five years clinically free from recurrence. Post-operative treatment, by means of radium and X rays, has proved of little value. Metastatic deposits have been found in all organs except the thymus, and their most common sites are the lungs and bones.

R. Gutierrez<sup>22</sup> considers that *uretero-nephrectomy*, either in one or two stages, is an operation that should be performed whenever the ureter, as shown by careful urological investigation, is found to be extensively involved in disease of the kidney. He describes his operation of uretero-nephrectomy, preferring this to nephro-ureterectomy whenever possible, and indicates the advantages of a two-stage operation. In about 18 per cent of all surgical conditions of the kidney the ureter is involved and its total removal called for either by uretero-nephrectomy or by ureterectomy subsequent to nephrectomy. When the diagnosis is perfectly established and it is desired to remove the kidney and ureter in one piece the first step of a uretero-nephrectomy should start from below, the ureter being divided close to the bladder in such a way that in the second stage the kidney together with the whole ureter can be removed through a lumbar incision.

S. H. Harris and R. S. Harris<sup>23, 24</sup> describe the operation of *renal sympathectomy* for the condition of renal sympatheticotonus. During the past four years their attention has been directed to the possibility of sympatheticotonus being the cause of various degrees of renal pain in patients in whom full investigation

of the urinary tract has revealed no definite abnormality. In such cases normal renal findings were the rule, with the exception of a positive pain reproduction test on pyelography, delay in the emptying of the pyelographic medium, and possibly slight clubbing of the renal calices and dilatation of the pelvis. Patients of this type are apt to be allowed to drift without any active treatment. In one such patient the writers performed renal sympathectomy, which involves the complete removal of the nerve filaments and ganglia in relation to the vascular renal pedicle, the renal pelvis, the ureteropelvic junction, and the uppermost inch of the ureter. The result of this operation was very satisfactory, and since that operation 28 patients have been subjected to the same procedure. In these, so far as it has been possible to determine, there has been no recurrence of pain, although in one patient the operation had to be performed at a later date on the opposite kidney. In some of these cases there was found to be an associated generalized sympatheticotonus which in 3 was most marked on the side of the painful kidney, as for example increased excitability of the knee-jerk and delayed relaxation time in the lower limb. When this occurs it is a collateral diagnostic sign of importance. The writers describe certain pyeloscopic and pyelographic findings which they regard as being of diagnostic importance, and they state that if the giving of **Eserine** temporarily relieves pain this is a further indication for the operative treatment described.

The question of *transperitoneal nephrectomy* is once more raised by K. Haslinger.<sup>25</sup> In Hochenegg's clinic in Vienna there were 16 transperitoneal operations in 290 nephrectomies. Of these, 4 were for injury with 1 fatal case, four times as the result of failure of diagnosis in which 1 death occurred, once in a large kidney cyst, and seven times in kidney tumours without a death. Haslinger claims that on account of the exposure the transperitoneal method is a better operation than the retroperitoneal in a large number of cases of non-infected kidney disease. [The intentional adoption of this route in only 12 of 290 nephrectomies (4 per cent) does not appear to show a strong trend of opinion towards the general adoption of this discarded method.—J. T.-W.]

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## LABOUR AND ITS COMPLICATIONS.

*Beckwith Whitehouse, M.S., F.R.C.S.*

**Obstetric Shock.**—One of the results of the investigations of the Departmental Committee on Maternal Mortality and Morbidity has been to draw attention to the relationship of surgical shock to midwifery practice. Miles H. Phillips<sup>1</sup> observes that although a fatal case of shock following labour is a rare experience in any one practice, yet a considerable number of instances do occur throughout the country. In some cases the cause of alarming shock is quite obvious, e.g., rupture or acute inversion of the uterus, severe lacerations of the vagina or pelvic floor, and so forth—conditions which may be associated with a prolonged or difficult forceps operation. In a second and altogether different category, however, occur cases of shock which are more difficult to understand, in that symptoms of collapse are unexpected and without any



obvious predisposing factor. At first the patient's condition is not alarming. The labour may have been rather a 'tight fit' and at the close she may be a little cold and the pulse-rate over 100, but the general condition is not such as to warrant serious apprehension. In some of these cases, however, the symptoms of 'shock' gradually increase, and in a couple of hours after labour the patient may be *in extremis* and indeed die. We have ourselves met with one such case, happily not fatal, when symptoms of profound shock supervened upon a perfectly natural and normal labour. The delivery was unassisted, the loss of blood not in any way excessive, the uterus well involuted, and yet a few hours after labour the patient suddenly became so collapsed that the worst might have happened.

In considering the basic causes underlying these phenomena we must remember that traumatic shock may be either primary or secondary. The former is due to afferent impulses causing reflex vasodilatation in the skeletal muscles and a consequent marked fall of blood-pressure. In obstetric cases, as Miles Phillips points out, there is another factor in the sudden lowering of the intra-abdominal blood-pressure which follows evacuation of the uterine contents. An analogy may be drawn from the domestic rabbit, which dies when held up by its ears because its disused abdominal muscles cannot support the abdominal blood-vessels. This argument naturally establishes the *value of a firm abdominal binder* applied immediately after labour.

Secondary shock is the result of the cumulative action of histamine or some closely allied toxic substance which is liberated from damaged and crushed tissues, and which causes widespread relaxation of the capillaries. The work of W. B. Cannon<sup>2</sup> has established this fact in no inconclusive manner and further evidence of a similar character resulted from war experience. Quénu, quoted by Miles Phillips,<sup>1</sup> demonstrated that extensive wounds of muscles were particularly liable to cause profound shock, and that anything which favours absorption at the site of injury is favourable to its development. Thus surgical shock is most severe when the damaged area communicates with the exterior by only a small opening. Miles Phillips, applying these facts to obstetric practice, suggests that the unexpected secondary phase of obstetric shock may be caused by extensive *laceration of the muscles of the pelvic floor*, the levatores ani, especially when the trauma is not accompanied by deep tears of the perineum and vagina which expose the lacerated muscles. Professor Phillips is certainly right in observing that many obstetricians have felt 'something give way' under forceps traction without any serious tear of the perineal body itself.

Apart from such essential initiating causes of shock, there are other predisposing conditions, any one of which may be present on occasion during delivery. Under this category Phillips includes bodily fatigue from prolonged muscular exertion, cold from exposure, deprivation of food and water, sweating, hæmorrhage, anæsthetics, toxæmia of pregnancy, infection, and lastly, emotion. Hæmorrhage and anæsthesia are both of considerable importance.

H. H. Dale<sup>3</sup> has shown experimentally that both chloroform and ether sensitize the capillaries to the action of histamine. This is not the case with *nitrous oxide and oxygen*, and from the point of view of the prevention of shock nitrous oxide is unquestionably the safest anæsthetic to employ in obstetric work.

Not only in the prevention but also in the treatment of collapse following labour, Phillips stresses the importance of taking frequent *blood-pressure records*. During the last twelve months the recording of the blood-pressure during labour has been recognized as a standard requirement at the Jessop Hospital, Sheffield. Should the systolic pressure fall to below 100 mm., no operative treatment,

short of immediate necessities for hæmostasis, should be undertaken. 'Immediate repair of a perineal tear' is neither essential nor advisable under such conditions. Expression of the placenta should, in our opinion, also be deferred unless bleeding is actually in progress. In this connection we can recall a case where severe shock supervened upon a difficult embryotomy for an impacted shoulder presentation. No attempt was made to deliver the placenta, which was naturally expelled twelve hours later.

An interesting observation of Miles Phillips is that in his experience the fall of blood-pressure during and after labour is much less when scopolamine is used. Indeed, he states that the "combination of *scopolamine analgesia and gas anaesthesia* is the most beneficial advance in the management of labour which I have witnessed." Scopolamine is administered, without morphine, according to the method recommended by David Jennings<sup>1</sup>:  $\frac{1}{100}$  gr. is administered as soon as the pain begins to distress the patient, whether in the first or second stage; in half-an-hour the dose is repeated, and again if required at the end of the next half-hour; should further help be required, the dose is then repeated at two-hourly intervals. Phillips has never seen any ill-effects from the use of these large doses. The uterine contractions are not diminished, the baby is not somnolent, and the feeling of well-being, mental and physical, is very striking.

As additional aids in the prevention of obstetric shock the writer advocates the use of thick woollen stockings such as are used in operating theatres during all obstetric operations, the administration of **Glucose** solution (1 lb. to a quart of water), and the suppression of all causes likely to cause emotional disturbance.

Dame Louise McLroy<sup>5</sup> has called attention to the importance of the emotional factor during labour and the part that it may play in the production of severe shock. In analysing the causes of 26 maternal deaths in 9468 deliveries at the Royal Free Hospital, she attributes 6 to obstetric shock and 4 to shock from hæmorrhage. She observes that "fear, anxiety, and intense suffering during labour are predisposing factors, and that hæmorrhage is not always sufficient to account for the collapse, and sometimes death, which occurs after a long painful labour."

**Antiseptics in Midwifery.**—In the *British Medical Journal*<sup>6</sup> last year the question was raised as to whether **Lysol** is a reliable antiseptic for obstetric use, and some doubt was expressed as to its efficiency. Later it was stated in a memorandum issued by the London County Council and re-issued by the Central Midwives Board that different brands of lysol vary considerably in their bactericidal power, and that only strong solutions at best are capable of killing the *Streptococcus pyogenes*. Under the present Central Midwives Board's regulations, lysol used by midwives must conform to a 50 per cent cresol content. L. P. Garrod<sup>7</sup> has recently pointed out that to those familiar with the properties of germicides the use of lysol in obstetrics has always appeared mistaken. With the exception of phenol it is the most caustic of all antiseptics in clinical use, and as the result of this property the solutions in common use are dangerously near the point at which the antiseptic is totally ineffective!

Garrod investigated four commercial brands of lysol. One was the original German preparation of Schultze & Mayer, and the remaining three British products, all having a guaranteed 50 per cent cresol content. As to their bactericidal power, one was identical with the German article and one superior, but even the best left very little margin for safety. No preparation of lysol therefore can be judged as trustworthy.

Garrod has investigated in detail the bactericidal and bacteriostatic actions of the germicides at present employed against a single strain of *Streptococcus pyogenes* from a fatal case of septicæmia following abortion. Altogether fifteen

germicides were tested under conditions which imitated as far as possible in the laboratory those in obstetric use. **Brilliant Green** emerged from the investigation as by far the most potent of all the substances examined. It destroyed the streptococcus even in the presence of blood at a dilution of 1 in 10,000, and even in strong solutions is entirely without irritant action. In the 'blue paint' advocated by Victor Bonney and C. H. Browning<sup>8</sup> its concentration is 1 in 200, and Garrod considers it the "surest safeguard against streptococcal infection which can be used." The objection to its use is of course its staining property, but, as Garrod observes, whether stained linen or death from septicæmia is the greater evil is a question which seems to admit of only one answer.

Next in order of efficiency are **Monsol**, **Izal**, and **Cyllin**. These germicides of coal-tar origin form an emulsion with water as distinct from a solution, and their average efficiency is much greater than that of lysol. All are less poisonous than lysol and less irritating to the skin. Even in the strengths recommended for use (1-600) there is a clear margin of safety, and therefore they may be regarded as reliable.

Of the remaining antiseptics, **Acriflavine** and **Rivanol** are on the borderline of bactericidal efficiency, but **Mercurochrome** and the **Mercury Salts** are

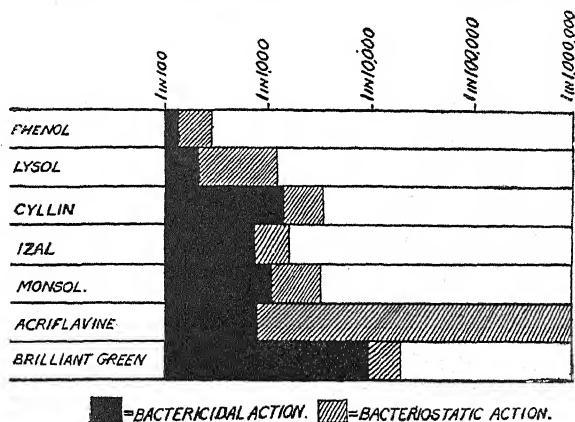


Fig. 65.—Table showing comparative efficiency of seven germicides tested.  
(By kind permission of the 'British Medical Journal'.)

quite ineffective. Mercurochrome is indeed a germicide incomparably weaker than is commonly supposed. Of the mercurial antiseptics the biniodide is much the weakest, but according to Garrod's investigations, none can be effective in the dilutions used clinically. **Eusol** is worthless in the presence of any considerable amount of organic matter. The effective bactericidal power of an aqueous solution is destroyed at once by the presence of blood or even peptone broth!

If obstetric prophylaxis can be served by merely bacteriostatic as against bactericidal action, then a valuable agent is available in **Acriflavine**. This is the most powerful bacteriostatic agent that we yet possess, but to be effective an adequate concentration must be maintained in the birth canal for several days, until in fact the placental site and all lacerations have healed.

Garrod's results are so important in the practical bearing they have on the prevention of puerperal sepsis that we think the table here reproduced (Fig. 65)

showing the comparative efficiencies of seven germicidal preparations in use may be of interest.

**Thymophysin in Obstetrics.**—E. E. Nelson<sup>9</sup> has published this year an important criticism of the mixture of thymus and posterior pituitary extracts introduced in 1926 by Nikolaus Temesvary<sup>10</sup> under the name 'thymophysin'. This preparation at present enjoys a wide popularity in many European and American obstetric clinics, and a considerable literature, mainly clinical, has grown up about it, especially in Germany. Temesvary claims that the addition of thymus extract modifies the action of pituitary posterior lobe upon the uterus, rendering the muscle less liable to fatigue, and regulating the contractions. In his most recent paper<sup>11</sup> he observes that the drug can be employed where there is no great disproportion between the pelvis and the head and where diseases of the heart and kidneys are absent. It is most effective at the beginning of the period of dilatation and is useless to initiate the onset of labour. Nelson's views, on the other hand, are based purely upon the results of pharmacological experiment, and are definitely at variance with those of Temesvary and other clinicians who have supported the introducer's claims. In the first place Nelson points out that not only thymus but also suprarenal, mammary, and pineal gland extracts and secretion will retard the manifestations of fatigue in electrically stimulated skeletal muscle. Also, is it correct to compare the reactions of skeletal muscle with those of the contraction of smooth muscle?

Thymophysin is packed in boxes of ten ampoules, each ampoule containing 1.1 c.c. and said to correspond to ten international units. In the packages investigated by Nelson, and bought in the open market, no expiration date or batch number appeared although there was a place for it. When examined by 'pressor' and 'oxytocic' methods which are fully described in the author's paper, the strength of the material was found to be only from 25 to 33 per cent of that claimed on the labels! Nelson was unable to demonstrate any difference in pressor or oxytocic activity between pituitary alone and pituitary plus thymus extract. Further, when *equivalent* doses of pituitary extract and thymophysin were compared in their action on excised uteri and on the blood-pressure, no difference whatsoever could be noted. The author expresses his belief that the clinical results obtained with thymophysin can be explained completely as due to the use of small doses of pituitary extract. In other words the "relative weakness of thymophysin has probably been a point in its favour." The glowing claims for the preparation made by the clinicians cannot be substantiated by laboratory experiment.

REFERENCES.—<sup>1</sup>*Brit. Med. Jour.* 1931, i, 833; <sup>2</sup>*Traumatic Shock*, Appleton; <sup>3</sup>*Jour. of Physiol.* 1919, lii, 355; <sup>4</sup>*Brit. Med. Jour.* 1929, Nov. 2; <sup>5</sup>*Lancet*, 1930, Jan. 11; <sup>6</sup>*Brit. Med. Jour.* 1930, i, 359; <sup>7</sup>*Ibid.* 1931, i, 572; <sup>8</sup>*Ibid.* 1918, i, 562; <sup>9</sup>*Jour. Amer. Med. Assoc.* 1931, Jan. 31, 352; <sup>10</sup>*Zentrall. f. Gynäkol.* 1926, Feb. 6, 322, and 1928, Aug. 18, 2088; <sup>11</sup>*Amer. Jour. Obst. and Gynecol.* 1930, Feb., 267.

## LARYNX, DISEASES OF.

A. J. M. Wright, M.B., F.R.C.S.

**Stenosis.**—The evidence is accumulating that, in the very great majority of cases in which laryngeal stenosis follows a tracheotomy and thus necessitates the retention of the tube, this is due to the tracheotomy having been performed at too high a level. M. F. Arbuckle,<sup>1</sup> in a general article on cicatricial laryngeal stenosis, supports this view. Also, H. Burmeister,<sup>2</sup> dealing with cases of laryngeal stenosis following tracheotomy in children, emphasizes the view that the surgeon should not be in too much hurry to carry out major operative measures. If patience is exercised, the mere growth in size of the larynx will in many cases allow the tracheotomy tube to be removed at a later date. [I am in agreement with this last view, with the proviso that if the tracheotomy

tube is allowed to remain, it must only do so at as low a level as possible, if necessary a new tracheal opening being made to attain this end.—A. J. M. W.]

*Stenosis from Double Abductor Paralysis of the Vocal Cords.*—These cases are not very uncommon, usually resulting from a bulbar lesion such as tabes or syringomyelia. Since the stenosis produced is permanent, various operations have been devised to widen the glottis and give an adequate airway. The most recent of these is that of Wittmaack. H. Bahre<sup>3</sup> gives a detailed description of this procedure, with an account of some successful results. The operation, instead of aiming at a lateral displacement of the cords to widen the glottis, is designed to alter the level of one of the cords, thus widening the glottis in a vertical, instead of in a horizontal, direction. This, in brief, is carried out by first splitting the larynx from the front and then removing the muscular process of the arytenoid cartilage on one side through a vertical incision, thus allowing the posterior attachment of the vocal cord to sink downwards. The mucous membrane incision is sutured and the larynx closed, and after a period of weeks or months attempts are made to leave out the tracheotomy tube.

**Granuloma.**—The occurrence of a granuloma in the larynx following exposure to mustard gas during the war has been noted by E. Watson-Williams.<sup>4</sup> He has himself come across three such cases. The typical clinical history appears to be the occurrence of some degree of hoarseness following exposure to gas, which hoarseness persists over a very long period without any depreciation in the general health of the individual. The time interval between exposure to the irritant and discovery of the granuloma may be as long as fourteen years, but the fact that some hoarseness has persisted during the whole of this interval would seem to show the etiological connection. On examination the granuloma is seen as a semi-pedunculated, slightly crenated, reddish swelling, most often springing from just below the anterior commissure. On histological examination the swelling is found to be composed of granulation tissue with a squamous epithelial covering. As a result of a very wide inquiry by the author, it seems that the condition here described is a great rarity.

**Carcinoma.**—

**ETIOLOGY.**—Chronic irritation seems to be an etiological factor in the occurrence of carcinoma in many parts of the body. In a very full review of his experience of over 900 cases of carcinoma of the larynx, A. G. Tapia<sup>5</sup> states his opinion that the irritation from tobacco is the most important factor. In support of this view he mentions the very great preponderance of carcinoma of the larynx in men. That over-use of the voice is not a factor seems to be shown by the immunity enjoyed by singers and other professional voice-users. Of his total of 993 cases, only 6 were in women, and of these 4 were smokers. He also states that while in Spain, where women seldom smoke, carcinoma of the female larynx is very rare, in the Tyrol, where smoking is common among women, cancer of the female larynx is not infrequently found. As a result of the careful analysis of the case histories, he has come to the conclusion that the inhalation of cigarette smoke does the damage. Cigar smokers, who as a rule do not inhale, seem to be relatively immune. He considers that some product of the distillation of tobacco is more likely to be the responsible irritant than the heat.

In contradistinction to this view, Sir StClair Thomson<sup>6</sup> states that he has not been impressed with the idea of syphilis, tobacco, or alcohol as being factors in the etiology of carcinoma of the larynx, although they are so potent in causing chronic laryngitis. Curiously, of his 80 cases submitted to laryngofissure, 10 were women and none of these had ever smoked.

**DIAGNOSIS.**—Since many cases of laryngeal carcinoma are not diagnosed until relatively late in the progress of the disease, it seems worth while giving Sir StClair Thomson's<sup>7</sup> observations on this question. In doubtful cases of cancer of the vocal cord there should be no hurry in attempting to establish a diagnosis. A few weeks of voice rest with abstinence from tobacco and alcohol, with repeated examinations, are valuable aids in settling the diagnosis. During this waiting period, both a Wassermann reaction and every reliable test for tuberculosis should be carried out. The importance of this latter is emphasized by the fact that tuberculosis is more often mistaken for cancer in the larynx than any other condition. True subglottic cancers are difficult to diagnose in an early stage, as the symptoms are absent or insignificant until the growth has extended far enough to invade the edge of the cord. In such cases, as in all doubtful ones, an exploratory laryngofissure may be justifiable. In doubtful cases, if a satisfactory fragment can be secured for biopsy, this should be done, but a report of innocence should not be blindly accepted.

**TREATMENT** (see also RADIUM TREATMENT OF CANCER).—

**Operation or Radiation.**—As in other regions of the body, there seems to be a swing of the pendulum towards operation and away from radiation in the treatment of laryngeal carcinoma. A. G. Tapia,<sup>8</sup> while admitting that radiation has given some brilliant results, is of the opinion that surgery should be the treatment of choice, radiation being reserved for those who refuse operation, for inoperable cases, or as an adjunct to surgical treatment. This view is supported by the majority of current contributions to the literature.

**Intubation through the Nose.**—It has been shown by Magill and others that a catheter passed through the nose tends to find its way through the glottis into the trachea, while if introduced through the mouth, it tends to pass into the œsophagus.

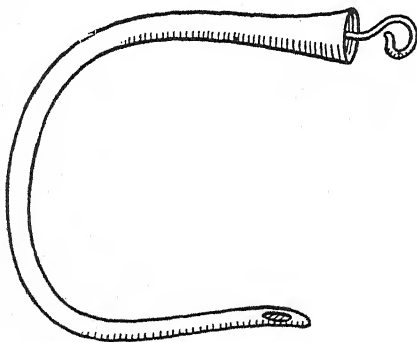


Fig. 66.—Porgé's catheter, with stylette inserted, ready for insertion into the nose. (By kind permission of the *British Medical Journal*.)

H. G. Bedford Russell,<sup>9</sup> as a result of a limited experience, confirms this observation. He suggests that intubation of the larynx by passing a catheter blindly through the nose should be a method of wide application. He considers that its chief value lies in the providing of a temporary airway in cases of laryngeal obstruction, as, for instance, by a new growth or thyroid enlargement. After such intubation has been carried out, tracheotomy can be performed deliberately and, cyanosis being absent, without

excessive bleeding. In addition, this blind intubation might be employed as a preliminary to tracheal anaesthesia in operations on the nose and throat. This preliminary passage of the catheter thus renders tracheal anaesthesia possible in cases in which the anaesthetist has not acquired skill in the passing of the catheter through the glottis by the oral route.

The detail of the method is briefly as follows: Anaesthesia of the nasal passages is induced by spraying them with a 10 per cent solution of cocaine during inspiration. A No. 12 Porgé's catheter, stiffened with a stylette, is employed. This, having been first bent into the shape of a C (Fig. 66), is passed through the nose and will usually be found to enter the glottis without any

great difficulty. This passage through the glottis can be recognized by listening to the breath-sounds through the catheter. The author suggests that this method of intubation might also occasionally be of use to replace a tracheotomy in cases of transient laryngeal obstruction.

REFERENCES.—<sup>1</sup>*Ann. of Otol. Rhinol. and Laryngol.* 1930, xxxix, 134; <sup>2</sup>*Zeits. f. Laryngol.* 1930, May, 359; <sup>3</sup>*Arch. f. Ohren-, Nasen- u. Kehlkopfj.* 1930, cxxvii, 41; <sup>4</sup>*Jour. Laryngol. and Otol.* 1930, Oct., 717; <sup>5</sup>*Ibid.* 1931, Feb., 139; <sup>6</sup>*Proc. Roy. Soc. Med.* 1931, Jan., 301; <sup>7</sup>*Jour. Laryngol. and Otol.* 1931, Jan., 31; <sup>8</sup>*Ibid.* 1931, Feb., 139; <sup>9</sup>*Brit. Med. Jour.* 1930, ii, 594.

## LATHYRISM.

Macdonald Critchley, M.D., F.R.C.P.

Reasearches into the puzzling and interesting problem of lathyrism have advanced notably within the last few years, and further insight is now available both into the pathology and causation of the disease. It is a disorder characterized by spastic paraplegia, and is closely associated with the ingestion of the seeds of a vetch of the lathyrus family. This plant is cultivated throughout the world, and outbreaks of lathyrism have been recorded in the Mediterranean countries of Europe, Russia, North Africa, Syria, and particularly in India. The commonest form responsible is the *Lathyrus sativus*, or German vetch; at times the Spanish vetch, or *L. clymenum*, or the chick-pea or red vetch (*L. cicera*) are associated with paralytic symptoms.

HISTORICAL.—Lathyrism has been known from the earliest times and has been described by several of the ancients. It is probable that Hippocrates was referring to this disorder when he narrated how the inhabitants of Ainos, who fed on pulse, developed weakness of the lower limbs. Reference was also made by Pliny the Elder, Galen, and by Avizenna. In Don's *System of Gardening*, the lathyrus is cited as causing an epidemic disorder on the Continent in the seventeenth century. So common was the affection that in 1671, George, Duke of Würtemberg, issued a proclamation forbidding the use of the lathyrus; subsequent edicts were given by his successor Leopold in 1705 and 1714. Epidemics were described in the Grand Duchy of Modena in 1691 and 1770. Tozzetti, in 1784, reported an outbreak in Tuscany from the adulteration of bread with chick-pea imported from Tunis. Early in the nineteenth century, outbreaks occurred in Loire and Cher (France) and also in Abruzzi. A small epidemic in Naples was observed in 1873 by Cantani, who first applied the term 'lathyrism'. Although this is the first indication in scientific literature of a causal association between the epidemic disorder and the ingestion of lathyrus, the connection had long been recognized by the laity. Thus in Italy the disease was termed 'cicerchia' (from *cicera*, a bean); in Abyssinia, it was called 'guoja boscetà' (from *guoja*, the lathyrus); and in Algiers, 'moerd djiben' (from *djiben*, the lathyrus). The association was legally established, and we read of the Nirot lawsuit wherein a farmer was ordered to compensate his servant who had been crippled by bread adulterated with lathyrus. In 1891-2 a minor outbreak occurred in Russia near Saratoff, on the lower Volga, where during a famine year bread was made partly of 'tchina' or flour from *L. sativus*. These Russian cases were studied minutely by the neurologists Schabalin, Semidaloff, and Kojewnikoff.

It is in India, however, that the great bulk of cases has occurred and is seen to-day. Although we first learn of lathyrism from Sleeman's *Rambles and Recollections*, describing the epidemic of 1833, and in the later reports of Kirk, 1845, and Irving, 1857-68, the disease has been known for centuries to the Hindu peasantry. In the *Bhāvaprakāsa*, written in 1550, we read, "the triputa pulse . . . causes a man to become lame and crippled, and it irritates the nerves". Again we find in the *Mādnava Nidāna*, "the patient when he attempts to walk, trembles and walks without co-ordination, the joints in the

lower extremities become loose; the disease is called *kalaya-khanya*." A popular rhyme, quoted by McCombie Young,<sup>1</sup> narrates, "from eating the black-pea with its yellow flour, comes trouble in the legs, flapping top-knot and swaying hips; behold the ill-effects of eating *matra*."

The extent and severity of lathyrism in various regions of India can be gauged from the report of Irving in 1856, of "thousands of victims"—amounting to 7 per cent of the population of the North-West Provinces. H. W. Acton<sup>2</sup> stated (1922) that in a journey of thirty miles from Sutna to Rewah, he passed 30 persons, of whom 8 were crippled with lathyrism. The same writer estimates that in North Rewah—a territory half the size of Scotland—there are 60,000 victims, or 6 per cent of the inhabitants.

'Khesari' or 'gharash', as the lathyrus is called in India, yields an unpalatable indigestible foodstuff which is ordinarily avoided by those who can afford to do so. It is an extremely hardy plant, however, and grows on soil which is too poor or too dry to sustain other cereals. During famine years, therefore, *L. sativus* may constitute the bulk if not the whole of the dietary; at such times lathyrism becomes highly prevalent. One of the chief factors responsible for the disease is the system of 'parwar' or bondage, whereby Brahmins who are forbidden to till their own land, employ casual labour. Such bondmen are paid in food instead of money, and during lean years their payment consists mainly of lathyrus. The labourer realizes the risk of paralysis in eating this cereal, but the alternative is starvation.

There are numerous ways of preparing food from lathyrus; it may be ground and mixed with wheaten flour, made into bread; or, added to rice, taken as dhal or khichuri.

**SYMPTOMATOLOGY.**—Lathyrism is extremely uncommon in females; it attacks males of all ages, but young vigorous men of good physique seem particularly vulnerable.

Symptoms develop suddenly, as a rule, after the patient has been living on lathyrus for two to five months. For a day or two previously there may

occur prodromata such as fever, chills, backache, cramps, and dysæsthesie in the legs. Very often immediate precipitating factors are demonstrable, such as undue physical exertion, or, more commonly, exposure to the cold or wet. Native belief emphasizes the causal connection between exposure and paralytic symptoms.

Weakness and stiffness of the lower extremities constitute the outstanding clinical features. Appearing abruptly, they rapidly increase in severity, reaching their maximum in a few days. Thereafter, some slight improvement may be noticeable, but the paresis persists at that level for an indefinite period. Pains, numbness, and sphincter impairment are not usually encountered; the upper extremities and the muscles of the

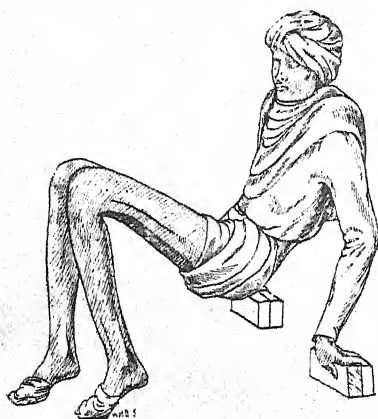


Fig. 67.—Picture of a 'crawler'.

thorax are not involved, and there is no implication of the bulbar mechanisms.

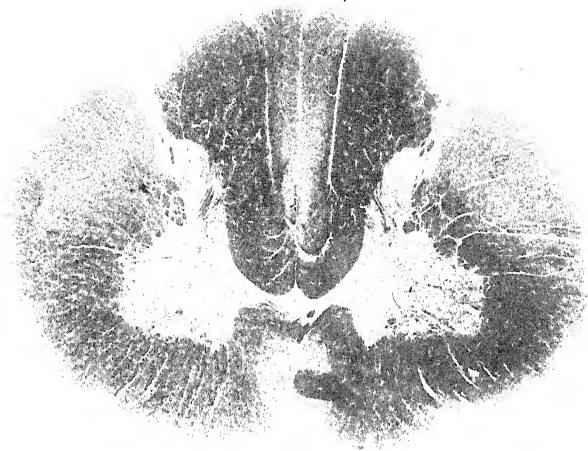
The physical signs consist in a pure spastic paraplegia with increased tendon reflexes, ankle and patellar clonus, and extensor plantar responses.



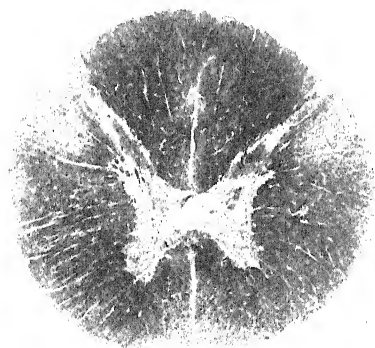
## PLATE XXXV

### LATHYRISM

(E. F. BUZZARD AND J. G. GREENFIELD)



*Fig. A.*—Trans-section of the cervical cord from Buzzard and Greenfield's original case of lathyrism. There is well-marked degeneration in the crossed and direct pyramidal tracts; and to a lesser extent in the columns of Goll. Some marginal degeneration is also noticeable.



*Fig. B.*—Trans-section of the thoracic cord from the same case. (Sections stained by Weigert-Pal's method.)



At first the attitude of the legs is one of extension with adduction; later a flexor posture with contracture develops. The gait in the early stages is one of bilateral spasticity; the patient advances on tip-toe with his legs crossed in a scissors-fashion. Progression is effected by tilting the pelvis and circumducting the limbs. With the onset of paraplegia in flexion the victim walks with hips and knees markedly bent; in the final stages, walking is impossible and a supine attitude on 'all-fours' is assumed. The patient advances by resting his weight on the balls of his toes and on his hands, which he protects with wooden crutches on supports (*Fig. 67*). Such individuals are spoken of in India as 'crawlers'. The unfortunate victims, now incapable of agricultural work, either take up stone-breaking or else drift to the large cities, where they become professional beggars.

Details as to spinal-fluid changes are available in the cases recorded from the Hôpital français at Damas. Here J. Trabaud, Moureked Khater, and Chewkat-Chaty<sup>3</sup> found a definite increase in the protein with a normal cell-count.

**PATHOLOGY.**—Although lathyrism is a common disease there is a striking paucity of pathological data. This is largely due to religious prejudice obstructing post-mortem investigation. Scheube and Grandjean refer to a fatal case in which a softening within the spinal cord was visible to the naked eye; no further particulars are available. Apparently, the first histological study was carried out by E. F. Buzzard and J. G. Greenfield and published in 1921.<sup>4</sup> These authors found a sclerosis of the lateral columns, the direct cerebellar, and dorsal columns of the cord. In the lumbar and thoracic regions the marginal region showed the same loose, honeycombed structure, with oedema at the point of entrance of the dorsal root. There was a close resemblance to the appearances seen in subacute combined degeneration and in ergotism. The illustration in *Plate XXXV* is from the same case. I. N. Fillimonoff,<sup>5</sup> 1926, also examined carefully the nervous system of a patient who had developed lathyrism thirty years previously in the Saratoff epidemic. A sclerosis of the lateral regions of the cord, not strictly confined to the pyramidal tract, was visible throughout the lower cervical, dorsal, and upper lumbar cord. The small blood-vessels were sclerosed and obliterated in places.

**PATHOGENESIS.**—Unquestionably there is a close connection between the use of *L. sativus* as a food and the development of lathyrism in man. Exactly how the noxious agent operates, however, is debatable, and A. K. Mukerji<sup>6</sup> has recently set out with care the numerous hypotheses which have been raised in this problem. The main theories may be very briefly set out as follows:—

1. *That lathyrism is due to the poisonous properties of L. sativus.* There are certain difficulties in the entire acceptance of the view that the disease is the direct consequence of lathyrus ingestion. No toxic alkaloid has been isolated from the plant which might represent the poisonous factor. Again, not all the consumers of khesari develop symptoms, as demonstrated by the striking immunity of the female members of a community. Lastly, lathyrism is prone to occur only at certain times of the year. No evidence is forthcoming however, to indicate that lathyrism is due to a poisonous condition of the plant, in the same way that ergotism has been associated with pathological states in rye.

2. *That lathyrism is due to the admixture of L. sativus with some contaminant.* This view is crystallized in the 'akta' theory which regards the mixture with another cereal—called akta, or *Vicia sativa*—as responsible for the disease. A. Howard, J. L. Simonsen, and L. A. P. Anderson<sup>7</sup> have demonstrated the poisonous alkaloids vicine and divicine in the seeds of akta; feeding experiments on ducks have shown that grain composed of *L. sativus* alone merely

causes the birds to put on weight, but a combination with akta is fatal. So far, however, there is insufficient evidence to connect lathyrism in man with the ingestion of akta.

3. *That lathyrism is due to a toxic amine produced in the L. sativus during germination.* This view, advocated by H. W. Acton,<sup>8</sup> stresses the high incidence of the disease during the rainy seasons of the year, at a time when the grain germinates more rapidly. L. H. L. Mackenzie<sup>9</sup> also pointed out that in the Gilgit agency the disease is produced only when the lathyrus has grown on virgin soil. Pigs which have strayed into a field of growing lathyrus have died of a rapidly ascending paralysis. The poisonous amine has been isolated, and when injected into mice has caused paralytic symptoms. In this way lathyrism resembles ergotism, but whereas in the latter the amine is produced by the *Claviceps purpurea*, in the former it develops during germination.

4. *That lathyrism is—in part at least—a deficiency disease.* T. C. M. Young<sup>10</sup> has pointed out that some other factor seems important besides the mere presence of *L. sativus* in the diet. Many people have emphasized that the dietary of such victims is always deficient, particularly in vegetables, milk, and fat. Hence, lathyrism is especially common in famine-stricken districts. Other diseases, known to be associated with vitamin-deficiency may coexist—night blindness, for instance. In the same district a Hindu village may be severely afflicted, while a Mohammedan community escapes, owing, it is believed, to the use by the latter of additional foodstuffs forbidden to the Hindu. This theory would relate lathyrism to pellagra, in which a deficiency in protein diet or in vitamin B is generally held to be the chief causative factor.

TREATMENT.—No measure is known which relieves the paraplegia once it has become established, but E. Mellanby<sup>11</sup> in a recent study, has suggested that the use of **Vitamin A** or **Carotene** is at least worthy of trial.

**Lathyrism in Horses.**—A number of cases have been recorded of lathyrism in domestic animals, in Europe as well as in India, associated with the mixing of lathyrus seeds with the fodder. Horses are particularly susceptible, and one is reminded of the cases at Worcester in 1893; of the notorious Bristol Tramway Co. outbreak of 1894; and the 1896 epidemic among the horses of the Rouen Omnibus Co. Symptoms consist in a weakness of the hind limbs and also in the presence of 'roaring'; a certain number of animals succumb to a respiratory paralysis. The autopsy findings of Barron-Althaus show an atrophy of the anterior horn cells and a sclerosis of the lateral columns of the spinal cord together with changes in the medullary nuclei and in the recurrent laryngeal nerves.

REFERENCES.—<sup>1</sup>*Ind. Jour. Med. Research*, 1927, xv, 453; <sup>2</sup>*Ind. Med. Gaz.* 1922, lvii, 241, 412; <sup>3</sup>*Rev. neurol.* 1929, ii, 106; <sup>4</sup>*Pathology of the Nervous System*, 1921, London; <sup>5</sup>*Zeits. f. d. g. Neurol. u. Psychiat.* 1926, cv, 76; <sup>6</sup>*Ind. Med. Rec.* 1921, xliii, 193, 230, 265; <sup>7</sup>*Ind. Jour. Med. Research*, 1922-23, x, 857; <sup>8</sup>*Ind. Med. Gaz.* 1922, lvii, 412; <sup>9</sup>*Ibid.* 1927, lxii, 201; <sup>10</sup>*Ind. Jour. Med. Research*, 1927, xv, 453; <sup>11</sup>*Brain*, 1931, liv, 247.

## LEGAL DECISIONS, RECENT. G. E. Oates, M.D., M.R.C.P., D.P.H.

**The Obligation to Notify Infectious Disease.**—A doctor and a parent were summoned by a borough council<sup>1</sup> for failing to notify a child suffering from diphtheria. The case against the doctor was considered proved, but the case was dismissed under the Probation of Offenders Act. It appeared that the doctor handed the notification certificate to the parent with a request that the latter should take the certificate to the Town Hall. The certificate never reached the Medical Officer of Health.

Every medical practitioner who attends on or is called in to visit an infectious patient is bound to notify the existence of infectious disease to the

Medical Officer of Health. Certain other persons are responsible for giving notice unless they have reasonable cause for supposing that notification has already been made. These, in order of responsibility, are the head of the family to which the patient belongs, his nearest relatives if present in the building or in attendance on him, persons in charge of or in attendance on him, and the occupier of the building. It may be generally stated that it is only rarely that lay persons give notice of infectious disease, the reason for this being that the doctor in attendance is expected to notify and nearly always does so. The notification certificate may be left at the office or residence of the Medical Officer of Health, but it is quite sufficient if it is sent by post properly addressed. The counterfoil of the notification certificate should be carefully filled in, since it affords some evidence that the notification has been properly made. It is not generally understood that the payment of a notification fee is in respect of the doctor's time and trouble in filling up and dispatching the certificate, and is in no way a payment for diagnosis. If it were so, it would obviously be inadequate. This matter is of importance in connection with mistakes in diagnosis. The doctor certifies and declares that in his opinion a certain patient is suffering from a certain disease. It sometimes happens that a doctor gives a bona-fide certificate and yet the diagnosis proves to be incorrect. He may then be approached by the Local Authority to withdraw his certificate. This is done not for the purpose of saving the fee, but in order that the number of notifications may tally with the number of cases of infectious disease finally diagnosed. This is not really a matter of vital importance, and doctors should firmly decline to withdraw certificates which they have made bona fide; the withdrawal or cancellation of such certificates is irregular, and also unjust to doctors in depriving them of fees to which they are entitled. (*See also CORONERS' CASES AND MEDICO-LEGAL WORK.*)

REFERENCE.—*Lancet*, 1931, i, 654.

#### **LEISHMANIASIS.** (*See KALA-AZAR.*)

#### **LEPROSY.**

*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

PROPHYLAXIS.—In January, 1931, twenty-two very experienced leprologists from all parts of the world met in Manila, under the auspices of the Directors of the Leonard Wood Memorial for the Eradication of Leprosy, and discussed all the main aspects of the problem.<sup>1</sup> Conclusions were arrived at regarding nomenclature and classification, and emphasis was laid on the importance of the lepra reaction. Early diagnosis, the study of contacts, follow-up of cases, methods of examination for diagnostic purposes, and the general lines of the treatment of the disease were discussed. Further research was considered necessary on epidemiology, etiology, pathogenesis, biochemistry, and therapeutics. The findings of the meeting of the Leprosy Commission of the League of Nations in the previous month at Bangkok were considered, and were given general approval on principle. It was decided to found an International Leprosy Association with a scientific journal of its own, and a temporary council was appointed with Dr. Victor G. Heisar as President and Dr. R. G. Cochrane, Secretary of the British Empire Leprosy Relief Association, as Secretary. The conference promises to be a landmark in the history of the age-long struggle against leprosy.

ETIOLOGY AND PATHOLOGY.—Experimental infection of animals is discussed by H. C. de Souza-Araujo,<sup>2</sup> who describes the local and general lesions containing acid-fast bacilli produced by injecting fresh lepromata swarming with lepra bacilli into monkeys, mice, rats, and guinea-pigs; but as control injections of the organisms previously killed by heat or antiseptics produced similar

local and distributed nodules, he points out that there is no proof that multiplication of the organisms occurs in the tissues of such animals. E. Mareboux, J. Markianos, and V. Chlorine<sup>3</sup> support this view with experiments to show that apparent cultures of the acid-fast organism of rat leprosy lose their vitality and power of infecting rats after two months in so-called cultures. S. N. Chatterji<sup>4</sup> reports unsuspected sources of infection with leprosy through contact with servants, especially cooks, fruit and food contaminated by leper sellers, and among nurses, school teachers, washerwomen, etc., coming into contact with leprosy infection, so that no one can be quite safe when living in leprosy-infected areas.

M. L. Ahuza and S. M. K. Mullick<sup>5</sup> found that the Wassermann test and the precipitation reaction of Khan gave parallel results in 90 per cent of 100 lepers. In the Federated Malay States Medical Report for 1929<sup>6</sup> it is recorded that the new admissions numbered 251, but the actual number of new cases is lower owing to transfers. At the end of the year 1055 were detained, and 111 more were in the Penang Leper Settlement. No case was discharged, because no facilities exist for separating the bacteriological-positive and negative cases, but it is hoped to remedy this shortly. It is now admitted that the disease can only be controlled by the discovery and treatment of as many early cases as possible, in special clinics without confinement wherever practicable. "Under present conditions, the diagnosis of leprosy is being equivalent to a sentence of imprisonment for life; it is not surprising that lepers should try to conceal themselves."

CLINICAL.—The term 'lazarine leprosy' is applied by V. Pardo-Castello and G. M. Caballero<sup>7</sup> to acid-fast bacillus containing single large ulcers following the occurrence of bullæ and sloughing. Of this type they have seen twenty-three cases, usually affecting the extremities, and sometimes causing fatal septicæmia or necessitating amputation. They advise packs and irrigation with chlorinated soda.

TREATMENT.—**Chaulmoogra Oil**, applied to the nasal cavities by atomization of either pure oil or from 25 per cent to 75 per cent dilutions with olive oil, with the addition of benzo-cocaine as a local anæsthetic, is advised by T. J. Dimitry<sup>8</sup> for the treatment of nasal infection, with beneficial effects on eye complications. He also applies these preparations to the conjunctiva. H. C. de Souza-Araujo<sup>9</sup> supports the generally-used modern treatment of leprosy and has had cases remaining clear for two years, but does not yet know if the good results will be permanent. G. H. Wildish and D. G. Stoute<sup>10</sup> report good results from the alternate use of 10-gr. doses of **Potassium Iodide** three times a day until a reaction occurs, followed by **Tartar Emetic** intravenously in from  $\frac{1}{4}$ -gr. to 1-gr. doses twice a week up to ten injections. Ulcers of the skin are especially benefited. W. H. Hoffmann<sup>11</sup> once more advocates **Gold Treatment** for leprosy eye affections, but he omits to mention the essential point of dosage. M. A. Gohar<sup>12</sup> advocates the old treatment with **Vaccines** made from leprosy nodules, preferably autogenous ones. E. Muir<sup>13</sup> deals with the treatment of leprosy on the lines of his well-known work, and he now regards intradermal infiltration with the **Ethyl Esters**, used extensively recently in the Philippines, as the most effective plan.

REFERENCES.—<sup>1</sup>*Phil. Jour. Sci.* 1931, April, 449; <sup>2</sup>*Trans. Roy. Soc. Trop. Med. and Hyg.* 1931, April 25, 577; <sup>3</sup>*Comptes rend. Soc. de Biol.* 1931, May 1, 1191; <sup>4</sup>*Ind. Med. Gaz.* 1931, March, 129; <sup>5</sup>*Ind. Jour. Med. Research*, 1930, Oct., 707; <sup>6</sup>*Jour. Trop. Med. and Hyg.* 1931, April 15, Sup. 31; <sup>7</sup>*Arch. f. Dermatol. u. Syph.* 1930, July, 109; <sup>8</sup>*Amer. Jour. Trop. Med.* 1931, Jan., 65; <sup>9</sup>*Trans. Roy. Soc. Trop. Med. and Hyg.* 1931, April 25, 599; <sup>10</sup>*Jour. Med. Assoc. of S. Africa*, 1931, Jan. 1, 21; <sup>11</sup>*Jour. Trop. Med. and Hyg.* 1930, Aug. 15, 233; *Ibid.* 1931, June 15, 166; <sup>12</sup>*Trans. Roy. Soc. Trop. Med. and Hyg.* 1931, Aug. 8, 87.

**LEUKÆMIA.***Stanley Davidson, M.D., F.R.C.P.E.*

**ETIOLOGY.**—The problem of whether the leukæmic state is the result of an abnormal bone-marrow responding to infection, or is a form of neoplasm of the hæmopoietic tissues, has never been settled. J. H. Easton<sup>1</sup> is in favour of the former hypothesis, and in support describes three cases of acute myelogenous leukemia, which started with intense sepsis of the throat. The white count in the early stage showed a leucopœnia affecting the granular cells, followed by the appearance of a leukæmic blood picture of the myelogenous type in the late stages.

That the clinical picture of acute leukæmia may not always be the typical one, starting with an insidious onset, is shown by three cases reported by N. B. Gwyn,<sup>2</sup> which began in a dramatic fashion, in one case with acute renal pain and hæmaturia, in the second case with cerebral symptoms, and in the third case with acute arthritis.

The gastro-intestinal tract has received but little attention in the leukæmias. W. S. Boikan<sup>3</sup> studied 11 cases of myelogenous and 3 cases of lymphatic leukæmia, with special reference to this problem. Non-specific changes were found in 9 cases, consisting of hæmorrhages, ulceration, and secondary inflammatory processes. Specific changes were found in 2 cases of acute myelosis, consisting of an infiltration of the appendix and an infiltration of Peyer's patches, respectively. Specific changes were found in one case of chronic lymphatic leukæmia. The stomach was enormously enlarged with huge convolutions on the inner surface, giving it a brain-like appearance, and the intestines were beset with plaques and polyp-like infiltration. In reviewing the literature, another such case was not discovered. The case was found, however, to parallel exactly those described as aleukæmic lymphadenosis or pseudo-leukæmic gastro-intestinalis. These facts, the author concludes, are in favour of the hypothesis that the aleukæmic and leukocythæmic leukæmias are fundamentally identical.

**TREATMENT.**—While some doubt exists whether irradiation treatment of the leukæmias by deep **X-ray Therapy** prolongs life, all workers are agreed that it is the best treatment available and undoubtedly makes the patient more comfortable and keeps his general health at a higher level. F. A. Knott and W. L. Watt<sup>4</sup> point out that in the acute leukæmias there is a definite risk of marked constitutional reaction, and it may be difficult to decide which cases will respond well to irradiation therapy. As an index to prognosis and to the response to irradiation the authors have developed a test based on the numbers of active phagocytes present in the patient's blood. They find that the higher the percentage of active phagocytes present the better the prognosis and the response to treatment. (*See also X-RAY THERAPY.*)

**Acute Monocytic (Histiocytic) Leukæmia.**—W. Dameshek<sup>5</sup> gives a very full discussion on what is now recognized to be a third form of leukæmia arising from the reticulo-endothelial system, characterized hæmatologically by an extreme degree of monocytosis and histiocytosis. In another paper<sup>6</sup> he describes the appearance of the histiocytes in the peripheral blood, and brings strong evidence in support of the theory that the monocyte is produced from the reticulo-endothelial cell, the histiocyte, and bears the same relation to it as the polymorph does to the myelocyte. Histiocytes are not found in normal blood, but appear in the peripheral stream in a variety of conditions, such as monocytic leukæmia and various infective diseases. Dameshek, after surveying the literature, believes that only eighteen well-substantiated instances of acute monocytic leukæmia have been described since the original report in 1913 by Reschad and Schilling-Torgau. This is the most complete article so far written on acute monocytic leukæmia. The disease is recognized by the

presence of a high percentage of histiocytes in the blood-stream, and is rapidly fatal in a similar way to all the other leukæmias, from which it could not be distinguished by the clinical manifestations alone.

W. E. Cooke<sup>7</sup> has reported a case of acute monocytic leukæmia since the appearance of Dameshek's paper. The patient was a boy of 19 who for the previous three weeks had suffered from increasing anæmia, hæmorrhages from the gums, and pyrexia. The spleen extended three inches below the costal margin, the superficial lymphatic glands were not enlarged. The red-cell count was 1,260,000; the white-cell count 49,800, of which 87 per cent were monocytes and histiocytes. The patient died within six weeks of his first symptoms.

REFERENCES.—<sup>1</sup>*Lancet*, 1930, ii, 1394; <sup>2</sup>*Canad. Med. Assoc. Jour.* 1930, July, 35; <sup>3</sup>*Arch. of Internal Med.* 1931, Jan., 42; <sup>4</sup>*Brit. Med. Jour.* 1930, ii, 991; <sup>5</sup>*Arch. of Internal Med.* 1930, Oct., 718; <sup>6</sup>*Ibid.* 1931, June, 968; <sup>7</sup>*Lancet*, 1931, ii, 120.

### LIVER EFFICIENCY TESTS.

Robert Hutchison, M.D., F.R.C.P.

Galactose is beginning to be preferred to lævulose for testing liver function. It is obtainable in pure form, is readily absorbed, is converted into glycogen by the liver with more difficulty than other sugars, is practically not utilizable by any other tissues than the liver, and is readily excreted in the urine.<sup>1</sup> The test consists in administering 40 grm. on a fasting stomach and determining the urinary output for the ensuing five-hour period. T. L. Althausen and others<sup>2</sup> criticize all sugar tolerance tests on the ground that in individual cases of proved disease of the liver these tests may fall within the limits of the normal. They have modified the dextrose tolerance test so as to overcome this objection. Their method consists in the administration of insulin, dextrose, and water followed by observations of the blood-sugar level for a period of three hours. The blood-sugar is estimated in the morning fasting, and 20 units of insulin are injected. Twenty minutes later 50 grm. of dextrose in 500 c.c. of water are given by mouth and followed by 1000 c.c. of water. After this two samples of blood are taken at intervals of thirty minutes, and two more at intervals of one hour. In persons without any hepatic disease the blood-sugar curve is like that of a normal curve after glucose alone, except that the original level is reached in three hours instead of in two, but in all cases of liver affections there is a terminal hypoglycæmia, i.e., 70 mgm. sugar per 100 c.c. blood or less. The test has the advantage of simplicity and requires no special equipment. Its chief limitation is its inaccuracy in cases of diabetes mellitus with pronounced morning hyperglycæmia.

M. Goodman and J. E. Connery,<sup>3</sup> from a study of twenty cases, have found no evidence that Widál's leucocyte test for hamoclastic crisis is a test for liver function. I. R. Jankelson and S. L. Gargill<sup>4</sup> describe a simplified form of the bilirubin test, and conclude that bilirubin injected intravenously in normal persons is rapidly excreted by the liver and that there is definite bilirubin retention in disease of the liver but none in chronic cholecystitis. G. M. Piersol<sup>5</sup> reviews his experience with several tests and decides that the three best are: (1) The bromsulphalein test; (2) The estimation of the serum bilirubin; (3) The occurrence of urobilinogen in the urine. He considers the last the most delicate test of impaired liver function. He admits, however, that all the tests are disappointing if regarded as means of recognizing liver disturbance before gross clinical evidence of it appears. They are useless in all focal lesions, but are of some help in differentiating the various types of jaundice and in estimating the degree and extent of damage in diffuse affections of the liver. They are thus more of prognostic than diagnostic value.

REFERENCES.—<sup>1</sup>*Arch. of Internal Med.* 1931, March, 391; <sup>2</sup>*Ibid.* 1930, Sept., 482; <sup>3</sup>*Ibid.* Dec., 1018; <sup>4</sup>*New Eng. Jour. Med.* 1931, March 12, 547; <sup>5</sup>*Canad. Med. Assoc. Jour.*, 1930, Oct., 524.



## PLATE XXXVI

### NON-PARASITIC CYST OF THE LIVER

(P. D. ACKMAN AND L. J. RIVERA)



Drawing of the liver cyst as it appeared at operation. A schematic sagittal sectional view is added to demonstrate the depth and size of the cyst.

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'British Journal of Surgery'*

# PLATE XXXVIII

## RADIOGRAPHY OF LIVER ABSCESS

(C. L. WILMOTH)



Fig. A.

Fig. A.—Abscess of liver. After aspiration of three ounces of pus, one ounce of iodized oil was injected through needle. This very definitely determines its size, shape, and boundaries.



Fig. B.

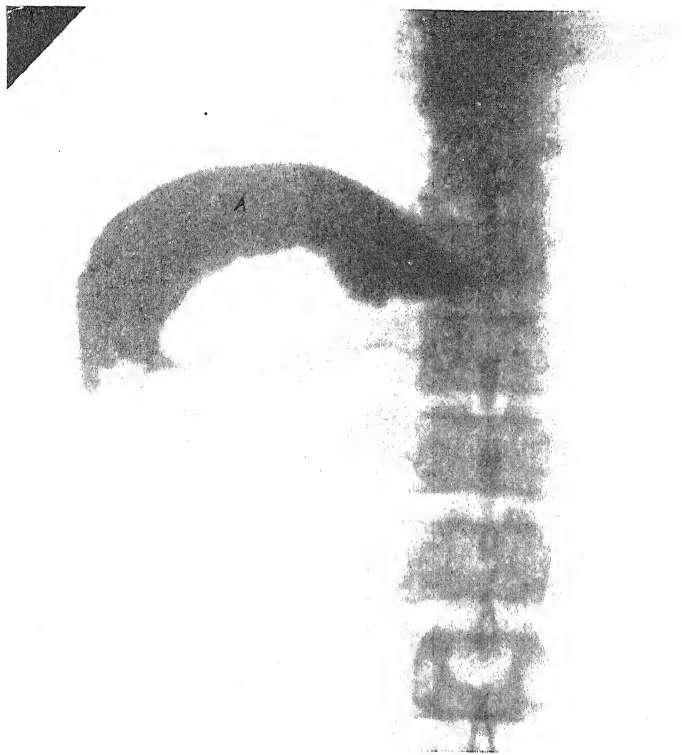
Fig. B.—Lateral view showing abscess with one ounce of iodized oil injected into the cavity. Its position in relation to the sternum and vertebra is definitely outlined. The shadow has an hour-glass constriction.

Plates XXXVII and XXXVIII by kind permission of 'Annals of Surgery'

PLATE XXXVIII

RADIOGRAPHY OF LIVER ABSCESS—*continued*

(C. L. WILMOTH)



*Fig. C.*—Patient with perihepatic abscess. The exploring needle was inserted in the ninth interspace in the anterior axillary line. Pus was found in the anterior perihepatic space; 50 c.c. of pus withdrawn and 20 c.c. of iodized oil injected through needle. The oil at once sank to the lowest level below the diaphragm (A). Patient lying flat on his back.



**LIVER, GUMMA OF.***Robert Hutchison, M.D., F.R.C.P.*

J. Friedenwald and T. H. Morrison<sup>1</sup> have made a careful study of ten cases of gumma of the liver. They point out that it is a rare condition and that males are far more often affected than females, the greatest incidence being between the ages of 30 and 50. In only about 40 per cent is a history of primary infection obtainable, and the time which elapsed between infection and the appearance of the hepatic disease varied from three and a half to twenty years. Gumma is often latent, and the occurrence of symptoms depends upon its size and location.

**SYMPTOMS AND SIGNS.**—Before localizing symptoms occur, general manifestations such as digestive symptoms, loss of flesh, fever, jaundice, and ascites are frequently observed. The onset is usually gradual, the most important signs being pain and abdominal distension. Symptoms of indigestion are often associated with chills and fever, and progressive loss of weight, and not infrequently jaundice. The liver gradually enlarges, and ascites is not uncommon. The most important sign is, however, the detection of a gummatous mass in the liver, which may occur as nodules or as a large rounded tumour which may involve the left as well as the right lobe of the liver. Enlargement of the spleen is frequent. The blood Wassermann test is not always positive.

**DIAGNOSIS.**—This is not difficult if a definite history of luetic infection can be obtained in a patient affected with a mass in the liver, who has discomfort and pain in the right upper quadrant of the abdomen with distension, indigestion, fever, loss of weight, jaundice, ascites, and enlargement of the spleen. It is strengthened by a positive Wassermann test. The two diseases with which gumma of the liver may be especially confused are carcinoma and cirrhosis. In case of doubt, the result of the therapeutic test will clear up the diagnosis.

**PROGNOSIS.**—The prognosis is satisfactory if treatment is thoroughly carried out and undertaken sufficiently early before a resulting cirrhosis has developed. The results are striking. In spite of this, however, the persistence of the positive Wassermann reaction in the blood is well recognized.

**TREATMENT.**—The treatment consists in the administration of **Iodides** and **Mercury**. The effect of these remedies is extremely favourable. The masses, ascites, and other symptoms disappear, and the liver and spleen rapidly diminish in size. The administration of arsphenamine is dangerous and its use is contra-indicated.

REFERENCES.—<sup>1</sup>*Amer. Jour. Med. Sci.*, 1930, Nov., 656.

**LIVER, SURGERY OF.** (*See also X-RAY DIAGNOSIS.*)*A. Rendle Short, M.D., F.R.C.S.*

**Cysts of Liver.**—F. D. Ackman and L. J. Rhea,<sup>1</sup> of Montreal, report a case of non-parasitic cyst of the liver (*Plate XXXVI*), and discuss the condition. Such cases are rather uncommon, and usually the cyst is congenital. The treatment is either extirpation, or opening and marsupialization.

**Hepatic and Perihepatic Abscess.**—C. L. Wilmoth,<sup>2</sup> of Baltimore, demonstrates these abscesses by aspiration, injection of iodized oil, and X-ray photography (*Plates XXXVII, XXXVIII*). The accurate localization is very helpful in planning the incision to evacuate the pus. About 30 to 66 c.c. of pus is aspirated, and a smaller quantity of the iodized oil injected.

REFERENCES.—<sup>1</sup>*Brit. Jour. Surg.* 1931, April, 648; <sup>2</sup>*Ann. of Surg.* 1931, March, 722.

**LUMBO-SACRAL ARTICULATION, DISEASE OF.** (*See SACRO-ILIAC AND LUMBO-SACRAL ARTICULATIONS.*)

**LUNG, ABSCESS OF.** (*See also* ENDOSCOPY IN LUNG DISEASE.)*W. H. Wynn, M.D., F.R.C.P.*

In several recent volumes of the *MEDICAL ANNUAL* the increase in the number of cases of abscess of the lung has been noted. Several explanations have been advanced for this, but it seems probable that the two main factors have been the greater number of operations on the upper respiratory tract and the influenza epidemics with their associated increased prevalence and virulence of streptococcal infections. G. J. Heuer<sup>1</sup>, in discussing the etiology, states that clinically pulmonary abscess includes a variety of conditions, which present sometimes the features of abscess, sometimes those of gangrene, and sometimes those of bronchiectasis. When the lesion is single, discrete, and encapsulated we speak confidently of 'pulmonary abscess', but when the nature of the lesion is in doubt the term 'chronic non-tuberculous pulmonary suppuration' is used. Experimentally by the use of aspiratory, septic embolic, or combined methods a variety of lesions has been produced which resemble bronchopneumonia, abscess, gangrene, or bronchiectasis. To some observers these lesions occurring in man or experimentally in animals suggested different manifestations of one disease process. Clinically the sputum in 75 per cent of cases of abscess, 80 per cent of bronchiectasis, and 100 per cent of gangrene contains predominantly the anaerobic organisms found in the mouth of 80 per cent of all individuals. In the remaining 25 per cent of abscesses the sputum contains predominantly varieties of pyogenic cocci. Experimentally these anaerobic organisms appear to act in symbiosis. The importance of oral anaerobes in the causation of pulmonary suppuration strengthens the position of those who hold that abscess more commonly results from the aspiration of organisms into the bronchi and lung. In view of the ease and frequency of the entrance of organisms into the lung and the rarity of abscess, the importance of other factors, such as the virulence-resistance ratio, the blood-supply to the lung, and bronchial obstruction, must be apparent. Heuer gives certain points which he regards as important in the prevention of pulmonary suppuration: (1) In all operations on the nose, nasal sinuses, mouth, and throat, or elsewhere, careful and systematic nasal and oral hygiene should be carried out for some time before operation. (2) In all operations about the nose, mouth, and throat, whether under general or local anaesthesia, great care should be exercised in hemostasis and the removal of blood and mucus from the pharynx. (3) In all operations careful aseptic technique, the careful handling of tissues, and the avoidance of the ligation of large masses of tissue, whilst essential to all proper surgery, have an added importance in view of the relation of septic emboli to pulmonary abscess. (4) The frequent turning of the patient, pulmonary gymnastics, the encouragement of cough, and the over-ventilation of the lungs with carbon dioxide following operation suggest themselves as preventive measures in view of the aspiration theory of abscess and the importance of stasis or bronchial obstruction in their causation. (5) Prompt removal of foreign bodies from the bronchi and the removal of foreign bodies in wounds of the lungs. (6) The prompt recognition and treatment of such acute conditions as mastoiditis and osteomyelitis, which may give rise to embolic abscesses, and conditions such as peritonitis and hepatic and subphrenic abscess, which may give rise to occasional pulmonary abscess by lymphatic extension.

A. J. Scott Pinchin and H. V. Morlock<sup>2</sup> have studied 27 cases of lung abscess. They favour Ballou's classification into: (1) Single abscess, (*a*) with or without fluid level in the skiagram; (*b*) bronchiectatic abscess, acute or chronic; (*c*) abscess associated with bronchiectasis. (2) Multiple abscesses which may be associated with bronchiectasis. (3) Secondary to new growth. (4)

Tuberculous. It is possible to distinguish these various conditions by lipiodol injections. In their 27 cases 20 were single abscesses and the rest were associated with bronchiectasis; 70 per cent of the cases were between 20 and 45 years of age; and males were three and a half times more frequently affected than females. The right lung was more often affected than the left, and the lower and mid zone more often than the upper. Streptococci were present in 11 cases, streptococci and pneumococci in 5, pneumococci in 2, streptococci, spirochaetes, and fusiform bacilli in 8. Sixteen cases appeared to be primary, but in 10 of these the onset was sudden and it was impossible to be sure if the sudden illness was the onset of abscess or of a preceding influenzal condition. In acute cases the disease begins with a sudden onset of fever and malaise and there may be rigors. Cough develops early; at first dry, it becomes looser, and mucopurulent sputum is brought up. When the abscess communicates with a bronchus the sputum becomes purulent and is in large quantity. This large amount continues for some days and then falls to a lower constant level. Sometimes it ceases for a time, to be brought up again in large quantities. The odour is usually offensive from the time the sputum becomes purulent, but the offensiveness may not develop until the abscess becomes chronic and secondary infection with anaerobes occurs. The amount of sputum in these cases varied from  $\frac{1}{2}$  oz. to 30 oz. daily. Fever is usually present and is often increased with the retention of sputum. Rigors may occur. Haemoptysis may occur early or late and may be fatal. Physical signs are not characteristic. There is impairment of resonance with some flattening on the affected side. Most commonly the signs are those of consolidation, occasionally of cavitation, and the breath-sounds correspond. Signs may vary from time to time as the cavity fills or empties. Clubbing of the fingers occurred in 70 per cent. Leucocytosis is usually present; 18 per cent had over 30,000 leucocytes, 50 per cent between 20,000 and 30,000, 22 per cent had 15,000, and only 2 per cent under 10,000. Wasting is not an early symptom, but emaciation occurs later if the condition is untreated. The most common complication is a pleural effusion, which may be serous or purulent. Pyopneumothorax may occur and also a bronchopleural fistula. Cerebral abscess is rare.

DIAGNOSIS.—As regards diagnosis, the possibility of a lung abscess must always be considered when, following the acute onset of a respiratory illness, about the tenth to the fourteenth day a large amount of purulent sputum is coughed up. A missed empyema is seldom evacuated via a bronchus as early as this. The conditions most often confused with abscess are pulmonary tuberculosis, interlobar empyema, new growths, bronchiectasis, gumma, and purulent bronchitis. If the abscess is in an upper lobe the similarity with tuberculosis may be very great, but repeated sputum examination and radiology will exclude this disease. In interlobar empyema the history, physical signs, and radiological picture may be very similar. The rupture is usually much later in the disease and the condition commonly clears up rapidly without much evidence of infection of the lung parenchyma. Lung abscesses occur more frequently than interlobar empyema. A carcinoma of the lung usually produces much haemoptysis and no pus. A bronchial carcinoma in the early stages is comparatively easy to diagnose and fever is not present; in the later stages when bronchiectasis or abscess has occurred in the collapsed lobe differentiation may be impossible, but the history is always of some length and antedates the fever and excessive sputum. Supraclavicular glands are frequently enlarged, and bronchoscopy should be done on doubtful cases. The Wassermann reaction and therapeutic tests should differentiate a gumma. Bronchiectasis is distinguished by its long history, absence of leucocytosis

and by radiology. Bronchoscopy may give considerable help in diagnosis of abscess and in the exclusion of a foreign body or bronchial neoplasm. The radiological picture is not characteristic. There is usually a shadow with a diffuse margin except where it comes into contact with the pleura. Occasionally a cavity with a fluid level is seen. The main function of X rays is to locate the position of the abscess and to assist in its classification. Lipiodol injections assist in localization and the exclusion of bronchiectasis in the other lung. Mostly the lipiodol does not enter the abscess but passes into the bronchi around it (*Plates XXXIX, XL*).

**TREATMENT.**—Whilst in the past the results of medical treatment appeared to be disheartening and to justify early resort to surgery, recent reports have been encouraging, and it is generally agreed that a thorough trial of medical measures must be given before any surgical intervention. Acute cases often show a tendency to spontaneous recovery, and five of Pinchin and Morlock's cases so recovered. H. I. Spector<sup>3</sup> keeps patients at complete bed rest during the acute stages. **Postural Drainage** is practised several times a day, the frequency and length of time of drainage varying with the tolerance of the patient. Those very acutely ill may tolerate it for only a few minutes at a time. Soft nourishing foods are given, and there is no special effort to abolish the cough. If patients do not show any improvement in a reasonable length of time, and if the abscess is not peripheral, pneumothorax is attempted. If this is not successful, more radical surgery is resorted to. After complete subsidence of the acute symptoms patients are discharged from hospital with instructions to continue treatment at home and to report as out-patients. As long as signs remain they are urged to remain in bed for most of the day. The patients are thus treated at first like active, and later like quiescent, cases of tuberculosis. They are not permitted to return to work until physical and radiological examinations fail to show any lesion. Only then are they considered cured. Cases in which examination shows that the lesion has not completely disappeared are classed as 'improved'. Out of 21 cases of single abscess, 19 were treated medically, and of these 11 were classed as 'cured', 6 as 'improved', and 2 died (one six hours after admission, and one from peritonitis following a gastric fistula). Two were treated surgically; one of these recovered after a pneumothorax followed by incision, and the other died after surgical treatment elsewhere. All the cases of multiple abscess died whether treated medically or surgically, and Spector considers that in these cases little can be expected from any form of treatment. Pinchin and Morlock consider that an acute abscess should be treated medically with postural drainage for a period of six to ten weeks, during which time **Emetine, N.A.B.**, and other drugs may be used. If after this period the condition is not clearing surgery must be resorted to. If the case when first seen is of more than six to ten weeks' standing, it should be considered as chronic, and surgical treatment proceeded with.

J. Alexander and W. W. Buckingham<sup>4</sup> describe an early or non-cavernous stage of pulmonary suppuration when medical treatment is best and often cures. If this fails, a stage is reached when surgery may offer incomparably the best chance of cure. This period is followed by a terminal stage in which the chance of cure has been practically lost and operation can only be performed with great risk. In the early stage, in addition to rest in bed, postural drainage, fresh air, and food of high calorific value, they advise a few minutes' inhalation of 5 per cent **Carbon Dioxide** in 95 per cent **Oxygen** several times a day. When an abscess has formed, if less than six to ten weeks from the onset of the disease, continuance of the same treatment will bring about cure in many cases, and drainage by incision at this stage is dangerous and may



# PLATE XXXIX

## ABSCESSES OF THE LUNG

(A. J. SCOTT PINCHIN AND H. V. MORLOCK)

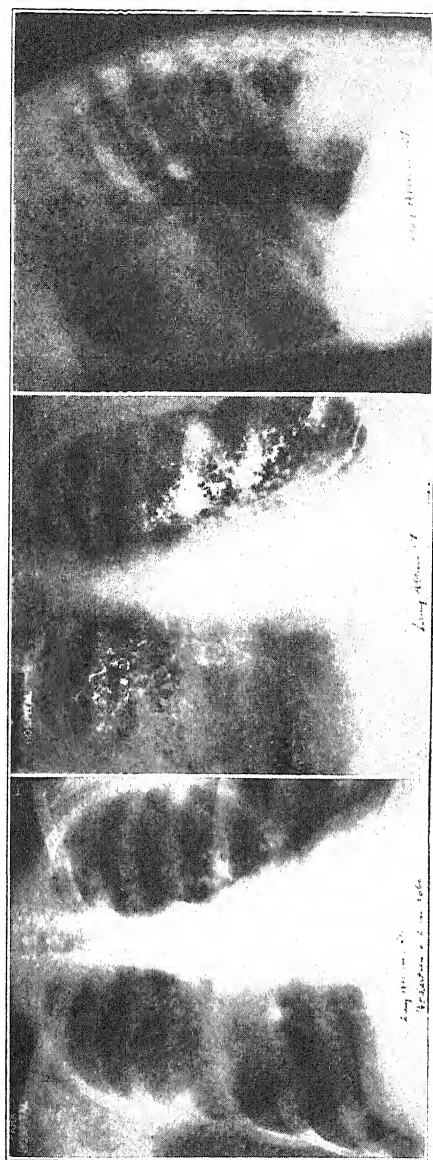


Fig. A.

Fig. A.—Lung abscess in right midzone.

Fig. B.

Fig. B.—Radiogram after lipiodol inspection. The lipiodol has not entered the abscess but has outlined the surrounding bronchi.

Fig. C.

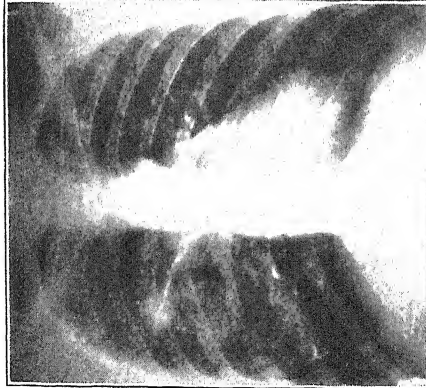
Fig. C.—Lateral view showing that the abscess is in the hilar region, and involves the anterior portion of the lung.

Plates XXXIX and XL by kind permission of the 'Lancet'

## PLATE XL

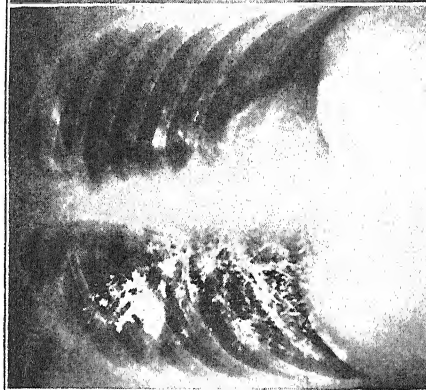
### ABSCESS OF THE LUNG—*continued*

(A. J. SCOTT PINCHES AND H. V. MORLOCK)



*Fig. D.*

*Fig. D.*—Abscess in right mid-zone. Artificial pneumothorax just started.



*Fig. E.*

*Fig. E.*—Lipiodol has entered the abscess.



*Fig. F.*

*Fig. F.*—Radiogram from another case showing treatment by artificial pneumothorax. Lipiodol shows that the abscess and the associated bronchiectasis in the right upper lobe has not been completely collapsed, although the lower and middle lobes are collapsing well.

cause spread of the suppuration. If postural drainage is unsatisfactory, they advise a trial of **Bronchoscopic Aspiration**, and if the abscess still persists a temporary phrenic nerve interruption may be performed before resorting to incision.

J. Fliederbaum<sup>5</sup> strongly advises the use of **Emetine**. He found improvement in 11 out of 18 cases of gangrene and in 13 out of 15 cases of abscess. It is injected intramuscularly. The initial dose is 1 cgrm. of emetine hydrochloride; injections are given every other day, the dose being increased by 1 cgrm. up to a maximum of 5 cgrm. The number of injections is eight to twelve. The course may be repeated after two to eight weeks. Unpleasant symptoms were not noted. He found that the temperature usually fell after two or three injections and became normal after five or six, and that the foul odour gradually disappeared. Leucocytosis increased, to become normal when the injections were stopped. Pinchin and Morlock used emetine in six cases, and believe that two were greatly benefited and one doubtfully so. They gave doses of 1 gr. daily for eight to twelve days, preferably combined with strychnine  $\frac{1}{30}$  gr.

Intravenous injections of **N.A.B.** has given good results in those cases with spirochaetes in the sputum. B. S. Kline and S. S. Berger<sup>6</sup> insist upon the importance of early diagnosis and intensive treatment with large doses of arsenical preparations (0.9 grm. neoarsphenamine every seventy-two hours in some cases). In 15 cases treated by this method 11 recovered. Graham<sup>7</sup> states that many cases associated with spirochaetal infections become healed in a dramatic manner merely by the use of intensive neosalvarsan treatment. Further information on the intensive treatment of early cases is desirable.

**Bronchoscopy** is a valuable adjunct in treatment when a trained bronchoscopist is available. From a diagnostic standpoint it may serve to differentiate simple abscess from that in association with malignant disease, discover foreign bodies, or demonstrate bronchial stenosis proximal to an abscess. Its stated advantages are that it more surely establishes free drainage, for with each introduction of the bronchoscope the drainage tract may be dilated or masses of granulation tissue obstructing the communication between the abscess and the bronchus removed. J. B. Flick, L. H. Clerf, E. H. Funk, and J. J. Farrell<sup>8</sup> in 172 cases of abscess referred 127 or 70 per cent for bronchoscopic treatment; 54 per cent of these were cured, 13 per cent improved, 6 per cent unimproved, and 23 per cent referred for surgical treatment. But, as Heuer points out, bronchoscopy in Philadelphia—the home of superlative bronchoscopy—yields only the same results as have been obtained with postural drainage.

**Phrenicotomy** has been used by several, and should be most useful in abscesses of the lower lobe. Alexander and Buckingham found it better than any other measure in controlling hæmoptysis from abscess or bronchiectasis. It may aid collapse of the cavity in patients treated by postural drainage.

**Artificial Pneumothorax** should yield the best results in early cases before the development of a thick fibrous wall. W. Whittemore and G. M. Balboni<sup>9</sup> found that the most suitable cases were those in whom the abscess is situated centrally, communicates with a bronchus, and a complete collapse can be obtained. The treatment should be begun within three or four months of the onset and should be continued for three or four months. But out of 18 cases only 11 per cent were cured and 33 per cent died during or as a result of the treatment. In a study of the literature they found on the other hand that among 129 collected cases 52 per cent were cured, 9 per cent were not improved, and 14 per cent died; 8.5 per cent developed empyema after the induction of pneumothorax. When the abscess is near the periphery adhesions usually form very early and prevent collapse, or being stretched may tear the adjacent

lung, so producing a grave pyopneumothorax. Alexander and Buckingham point out that a pneumothorax which is unsuccessful may create a condition of great danger if the abscess has later to be drained.

The question when to institute **Surgical Drainage** is a difficult one to answer. Each case must be considered individually. Sauerbruch's opinion that drainage should not be postponed more than eight weeks and that it should be used earlier for putrefactive suppuration and gangrene is generally accepted. It would appear justifiable in the majority of cases of single abscess to try medical measures for six to eight weeks, checking the progress by X-ray observations and the usual clinical studies. If improvement at the end of that time is definite, the treatment should be continued, but if the condition is clearly less favourable, surgical drainage should not be postponed. The cases most favourable for drainage are the single peripheral abscesses. Alexander and Buckingham advise local anæsthesia and consider that the axillary is preferable to the anterior approach in most abscesses of the upper lobe, and for abscesses in the lower lobe the posterior or posterolateral route. Removal of the ribs wide of the limits of the abscess is preferable to restricted resections as it affords a safe field of exposure for the operation and later aids closure by permitting sinking in of the chest wall. Great care must be taken to avoid infection of the pleura when the two layers are not adherent. In such cases firm adhesions must first be produced by gauze packing. Sewing the lung to the parietal pleura is regarded as dangerous, as organisms may track along the needle tracks. They are opposed to the use of a rubber tube for drainage, and prefer to cauterize a wide opening to the abscess—wider than the abscess itself unless it is very large—so that the abscess may be packed with moist medicated gauze.

Extrapleural paravertebral **Thoracoplasty** is indicated only for very chronic abscesses. The best results are obtained in abscesses with thin compressible walls or in small single or multiple abscesses, preferably with much intrapulmonary fibrosis. Certain very extensive multiple abscesses cannot be drained in the ordinary sense, and for them, if confined to one lobe, some type of lobectomy should be considered, as only complete eradication of the diseased tissue can cure them.

REFERENCES.—<sup>1</sup>*Surg. Gynecol. and Obst.* 1931, Feb., 394; <sup>2</sup>*Lancet*, 1930, ii, 842; <sup>3</sup>*Jour. Amer. Med. Assoc.* 1930, Sept. 13, 789; <sup>4</sup>*Ibid.* Nov. 15, 1478; <sup>5</sup>*Presse méd.* 1930, Sept. 13, 1242; <sup>6</sup>*Arch. of Surg.* 1929, xviii, 481; <sup>7</sup>Cited by Kline; <sup>8</sup>*Arch. of Surg.* 1929, xix, 1292; <sup>9</sup>*Ibid.* 228.

A. Tudor Edwards, M.Ch., F.R.C.S.

The factor which becomes more and more apparent in the treatment of pulmonary abscess is the necessity of surgical drainage before the walls of the abscess have got hard and fibrous. Under these circumstances it is unreasonable to expect external drainage to prevent the secondary complications, such as bronchiectasis, with or without bronchial fistula. Improvement in general clinical condition is not sufficient unless the radiological appearances are clearing up *pari passu*, otherwise surgical drainage should replace medical measures.

Following the failure of attempts at medical treatment over a period of six to eight weeks, various surgical procedures have been recommended, but the majority of thoracic surgeons are agreed that drainage operations, at any rate as a preliminary, are more satisfactory than collapsing procedures on the chest wall. It is possible that the basal abscess which is draining fairly satisfactorily into the bronchus may recover completely after a **Phrenic Evulsion**,

R. Fontaine's<sup>1</sup> experiences in seven cases treated surgically tend to confirm the above observation. Three of these cases were acute; one recovered

following drainage, one after phrenic evulsion, and the last after drainage and subsequent phrenic evulsion. Four other cases were subacute or chronic; the first was treated by phrenic evulsion followed by partial thoracoplasty and then drainage. At autopsy an undrained empyema was found. The second was treated by phrenic evulsion and thoracoplasty, and died with an unrecognized abscess in the contralateral lung. The third patient, who was treated by phrenic evulsion and thoracoplasty in two stages, died eight days later, probably from cerebral abscess. The last case recovered completely after phrenic evulsion and thoracoplasty. The different results in the acute and chronic groups suggest in addition to the advantage of preliminary drainage over collapsing operations alone that surgical treatment should not be delayed indefinitely if rapid improvement does not follow medical treatment.

E. Holman<sup>2</sup> considers the healing of pulmonary abscesses depends upon the resistance of the patient, the virulence of the organisms, and their number and type. He states that imperfect drainage or delay in securing complete evacuation through the bronchus or the chest wall favours the gradual deposition of fibroid tissue in the wall of the abscess, which will prevent obliteration of the lesion by re-expansion of the surrounding lung. The healing of persistent bronchial fistula following empyema or pulmonary abscess depends upon sufficient relaxation of the bronchus to permit closure by cicatricial contraction. This requires mobilization of the chest wall by resection of overlying ribs, thereby producing relaxation of the fibrous tissue lining the cavity and approximation of its walls.

REFERENCES.—<sup>1</sup>*Bull. et Mém. Soc. nat. de Chir.* 1930, Dec. 13, 1356; <sup>2</sup>*Surg. Gynecol. and Obst.* 1931, Feb., 122.

#### **LUNG, CYSTS OF.** (See ECHINOCOCCAL CYSTS.)

#### **LUNG, NEW GROWTHS OF.** (See INTRATHORACIC NEW GROWTHS.)

#### **LUPUS ERYTHEMATOSUS.** A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

**Gold Therapy.**—The results obtained in the treatment of this disease by gold salts continue to be reported on by various observers. H. P. Towle<sup>1</sup> has collected the reports of 420 cases treated in America and elsewhere. Of these, 209 were reported as cured, 183 as improved, and only 28 as failures. He notes a slightly higher percentage of cures among American cases, and raises the question whether this slight difference is due to the use of gold-sodium thiosulphate, which is more or less generally employed in America, while in foreign countries the complex organic compounds are more favoured. His figures show that more than 90 per cent of the cases of lupus erythematosus are favourably influenced by gold therapy. As to toxic reactions, he records 38 out of 266 cases, a percentage of 14.3. Among these are two fatal cases, and three of permanent blindness. Three cases of alarmingly high fever and two of stomatitis are also reported. As to causes predisposing to toxic reactions, he mentions high blood-sugar and low chloride content as contra-indications to the employment of gold therapy, and quotes Stokes as expressing the belief that a white-cell count of less than 4000 is a danger to gold therapy.

W. B. Rutledge<sup>2</sup> also reports satisfactory results with this treatment. Of 56 cases treated by him, 18 were arrested and 30 improved.

H. Haxthausen<sup>3</sup> has treated a series of cases with gold chloride, on the view that the results are due to the gold itself and not to any special complex compound. He uses a solution of 0.1 per cent and commences with 1 c.c. (= 1 mgrm. of the salt) once a week. He gives several injections of this strength, and if there is no improvement he increases the dose to 5 mgrm. per

week, and if this fails after several injections he gives 10 mgrm. The results have been favourable. He finds that the results are slightly better if combined with local **Finsen Light Treatment**. Of 37 cases treated with gold chloride alone, 12 were apparently cured, 10 improved, 7 improved but later relapsed, 7 were not affected, and 1 was aggravated. Of 35 cases treated with gold chloride and Finsen light combined, 12 were apparently cured, 18 improved, 1 improved but relapsed later, 3 were not affected, and 1 was aggravated. The toxic effects have been very slight in the author's cases. He recommends the drug as it is cheaper and more easily prepared, and its results appear to be at least equal to those of the more complex salts.

J. R. Driver and J. N. Weller<sup>4</sup> give an exhaustive summary of the toxic effects that have been observed in gold therapy. They divide these into immediate and delayed reactions. Of the immediate reactions are: (1) The anaphylactic, marked by varying degrees of syncope and shock; (2) Mild febrile reaction, associated with malaise and headache; (3) Metallic taste in the mouth; and (4) The foreign protein reaction, occurring when colloidal gold is employed and a protein used to protect it, and consisting of dull headache, suffusion of the eyes, and chill. Of the delayed reactions, which vary greatly in severity, may be mentioned fever, headache, nausea, occasionally with vomiting, malaise, and varying degrees of prostration; albuminuria is frequent, and hæmaturia, oliguria, and even anuria have developed. Stomatitis and gingivitis in varying degrees have been reported. Hepatitis with icterus and digestive disturbances, varying from vomiting and diarrhoea to ulcerative and hæmorrhagic enteritis, have been noted. A number of cutaneous manifestations have been described from mild erythematous and urticarial reactions to severe exfoliative dermatitis; also pigmentation of the skin. Focal reactions in the lesions sometimes precede retrogression of the patches, but in some cases activation and further dissemination of the disease have been noted. Damage to blood-vessels is frequent in the more severe examples, and cases of purpura, hæmorrhagic stomatitis and enteritis, hæmoptysis, epistaxis, hæmaturia, and metrorrhagia are reported. Reports of a number of unusual toxic manifestations and of the recorded fatal cases are added, including one which occurred in the author's own practice. The authors recommend that gold therapy should be instituted in very small doses, and that the doses be increased in amount gradually and conservatively.

**Bismuth Therapy.**—In the MEDICAL ANNUAL for 1931 (p. 300) reference was made to the treatment of lupus erythematosus by bismuth injections. R. M. B. McKenna<sup>5</sup> has tried the effect of combining inunctions of a 10 per cent bismuth oxychloride ointment to the affected areas with injections of bismuth, and claims satisfactory results. The number of cases quoted is small, but the method is worthy of trial.

REFERENCES.—<sup>1</sup>*New Eng. Jour. Med.* 1931, March 5, 467; <sup>2</sup>*Arch. of Dermatol. and Syph.* 1931, May, 874; <sup>3</sup>*Ibid.* 1930, July, 77; <sup>4</sup>*Ibid.* 1931, Jan., 87; <sup>5</sup>*Lancet*, 1931, i, 126.

#### **LYMPHADENITIS, MESENTERIC.** A. Rendle Short, M.D., F.R.C.S.

Light has been thrown upon the occurrence of severe attacks of pain in this condition by the anatomical researches of Professor F. Kiss, of Szeged, Hungary. He has demonstrated that the mesenteric lymph-glands are actually traversed by the nerves. This is well seen in *Plate XLI*.

REFERENCE.—<sup>1</sup>*Ann. d'Anat. pathol.* 1931, viii, July, 701.

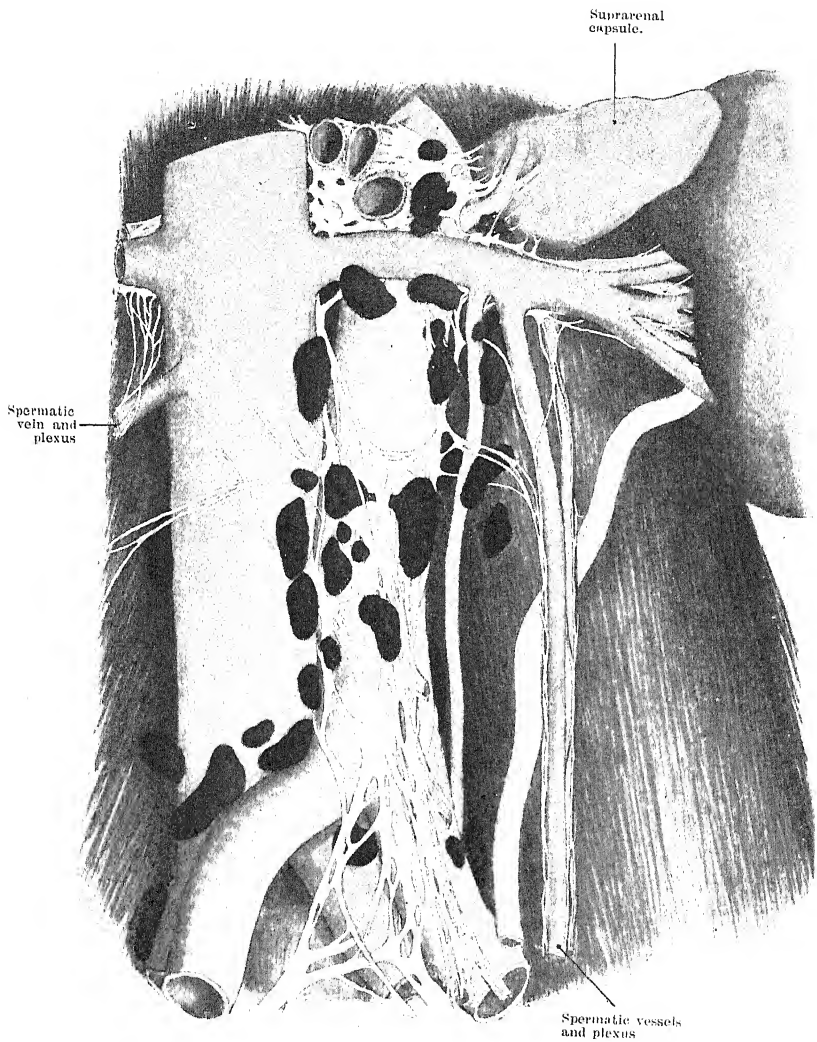
#### **LYMPHADENOMA.** (See HODGKIN'S DISEASE.)

#### **LYMPHANGITIS.** (See HAND AND ARM, INFECTIONS OF.)

PLATE XLI

MESENTERIC LYMPH GLANDS AND THE SYMPATHETIC

(P. KISS AND J. BOTÁR)



Showing the relationship between the lymph-glands in the region of the abdominal aorta and the lumbo-aortic plexus of the sympathetic.

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**MALARIA.** (See also PYREXIA, CONTINUED.)

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

**ETIOLOGY AND PROPHYLAXIS.**—The report on the four months' Indian tour of the Malarial Commission of the League of Nations<sup>1</sup> is considered by the Editor of the *Indian Medical Gazette* to be disappointing, as much detailed criticism, often based on very limited knowledge, is not followed by any comprehensive grasp of the immense problem or suggestions for any general policy. Thus the present dispensing of quinine is said to be insufficient, but no proposals for improving it are made. It is rightly pointed out that the Bombay Municipality have neglected simple prophylactic measures. Dr. Bentley's views on malaria in Bengal are supported, but for terai malaria the commissioners could suggest no remedy. They correctly state that malarial control for the 90 per cent of rural population is limited to selected groups of industrial value, for the obvious reason that the cost is prohibitive elsewhere. They pronounce in favour of the efficiency in India of the half-mile control radius. In their last chapter they pay full tribute to the quality of research work in India and enumerate the further requirements. They recommend the transfer of rural medical assistance to the Public Health Department.

"Studies in the Parasitology of Malaria," by R. Knowles, R. S. White, and B. M. D. Gupta,<sup>2</sup> is a remarkably comprehensive review (436 pages) of the subject in India and other malarial countries, which cannot well be abstracted, but will remain a mine of information for malariologists. The main conclusions are that the distribution of the disease is limited by the summer mean isotherms of 60° F., and in the case of the malignant tertian form by 70° F. Another interesting record is that of the second International Congress on Malaria at Algiers, in May, 1930, which General Graham reports on,<sup>3</sup> and which was attended by British delegates from home and India, although there was a notable absence of British communications. Celebrations in memory of Laveran were worthy of the occasion. *Records of the Malarial Survey of India*<sup>4</sup> (over 200 pages) contains instructive papers on the disease in Peshawar, Delhi, and Sind, the latter in connection with the Sukkur Indus River barrage scheme, by T. C. McCombie Young and S. A. Majid, regarding which they come to the interesting conclusion that this immense irrigation scheme, if water-logging of the soil is prevented, will tend to diminish flooding, with consequent fulminant malaria, and by raising the economic condition of the people will prove to be an antimalarial measure. In Assam, G. C. Ramsay<sup>5, 6</sup> found *A. minimus* the main malarial carrier breeding in streams or drains with insufficient flow of water, and that providing dense shade for the breeding streams is a valuable prophylactic measure.

Malaria in Rhodesia and South Africa is reported on by M. Watson<sup>7</sup> as the result of a visit; he emphasizes the necessity of identifying the actual carriers of the disease in Natal before spending money on dangerous-looking, but probably harmless, swamps. The same writer has had a controversy with C. A. Gill, of India, in the *British Medical Journal*, between the 'old school' and the 'modern school', which is summarized by the Editor of the *Indian Medical Gazette*,<sup>8</sup> and which brings out the necessity of considering the problem in each country in accordance with the local conditions, and the fallacies of applying the experience in one place to different conditions in another, and in laying down any generally applicable hard-and-fast rules. This is also brought out in a report by W. W. Clemesha and J. H. Moore,<sup>9</sup> on five years' anti-malarial measures in the hill districts of Travancore, in Southern India, where the anopheline carriers breed in the hill streams from March to June, but are washed out in the subsequent rainy season. By oiling measures begun early in March, before the larvæ had multiplied greatly, their numbers were kept in check, and

by combining this measure with treatment of all the malarial subjects—with euquinine in the case of the children, and with quinine and plasmoquine to destroy the mosquito-infecting gametocytes in adults—a most remarkable reduction of the incidence of malaria on a number of tea estates was obtained which was of great financial value. Such measures are, however, very difficult to carry out in the general civil population.

S. P. James<sup>10</sup> has recorded further detailed observations regarding benign tertian malaria in cases of general paralysis of the insane, which are of great interest, as many of the cases were watched for long periods without antimalarial treatment. The percentage of *Anopheles* that became infected after feeding on the blood of malarial subjects was lowest in March and April and highest from August to November. In untreated cases the parasites may remain in the blood long after fever has nearly or completely ceased, but between the eighth and the tenth months recrudescences of fever tend to occur, after which spontaneous recovery with immunity to the same type of malaria often develops, but not in cases where this natural course of the disease is interrupted by treatment with quinine. Infected *A. maculipennis* may remain infective for six months. James has also confirmed the observation of Yorke and Macfie, that prophylactic quinine fails to inhibit infection through the bites of *Anopheles*, although it may inhibit attacks of malarial fever for a time, but they recur on leaving off the drug. It is important to remember that these observations on untreated malaria apply only to the benign tertian form, as such experiments are not safe with the malignant tertian variety.

I. J. Kligler<sup>11</sup> has investigated whether any immunity results from the treatment by quinine and plasmoquine of children who continue to live in a highly infected area, and his data show that no immunity resulted.

H. C. Clark and L. H. Dunn<sup>12</sup> have found that the malaria commonly found in red spider monkeys of Panama cannot be communicated to man and vice versa, so that these animals do not apparently form a reservoir of human malarial infections. R. T. Green<sup>13</sup> in Malaya fed *A. maculatus* on the blood of *Macacus* monkeys infected with natural malaria, and readily obtained the development of oöcysts in their stomachs and sporozoits in their salivary glands; so he points out that great caution is necessary in that area before attaching importance to such findings in caught mosquitoes in relation to human malaria. On the other hand, P. F. Russell<sup>14</sup> failed to infect various *Anopheles* with bird malaria. C. H. Bath<sup>15</sup> has tested mosquito traps baited with human scent, by means of a V-shaped opening in screens of a house leading into the trap in the neighbourhood of the screened house, where human inhabitants could not be reached by the mosquitoes. As many as 400 to 1000 *Anopheles* might thus be caught in one night, and nearly 50,000 in eleven traps used for thirty-two days, so he regards the plan as of considerable prophylactic value.

R. Knowles and B. M. D. Gupta<sup>16</sup> have carried out enumerative and cultural investigations in cases of malaria kept for some time untreated, and they confirmed the known tendency for the benign form to produce a chronic relapsing fever, but for malignant tertian ones to undergo spontaneous cure, probably associated with the production of lysins in the plasma and phagocytosis of the parasites by the polynuclear and large hyaline leucocytes. In convalescent malignant tertians quinine increased the number of crescents in the peripheral blood, but a total of 0.006 grm. of plasmoquine in six days sufficed to exterminate the gametocytes of this form from the circulating blood.

TREATMENT.—In further studies on the treatment of malaria, A. J. Sinton<sup>17</sup> has shown that the permanent cure rate is increased by prolonged courses of large doses of **Quinine**, but their continued use may be harmful to the human

body; that different strains of benign tertian malaria may show variations in their virulence; and that there is a seasonal incidence of relapses, possibly related to relative humidity and high temperatures. He has also found indications that there is less multiplication of the parasites in chronic than in recent benign tertian infections, probably due to the development of some degree of immunity. In a further paper the same writer<sup>18</sup> summarizes his researches on malarial treatment, and concludes that **Cinchonine Preparations** are effective against all forms of the parasites except the sexual stages of *P. falciparum*, for the destruction of which **Plasmoquine** is also required; and that **Arsenical Preparations** act like quinine. He describes a standard treatment with his **Alkaline Mixture and Quinine**, with the addition of  $\frac{1}{4}$ -gr. of plasmoquine once daily after food for one week, which he thinks should cure 80 per cent of malignant, and 70 per cent of benign, tertian infections. In chronic relapsing benign tertian cases the doses of plasmoquine should be raised to  $\frac{1}{2}$  to  $\frac{1}{4}$  gr. S. P. James, W. D. Nicol, and P. G. Shute<sup>19</sup> record an experiment to show that 0.02 grm. of plasmoquine, on the day before infection with mosquito-borne malaria, and the same dose thrice daily on the following six days, prevented infection taking place. If further work should show that smaller and less toxic doses will have the same effect, an important practical result may accrue. P. R. Russell<sup>20</sup> also reports excellent prophylactic effect of plasmoquine against avian malaria. J. A. Manifold<sup>21</sup> reports this drug to be efficacious in preventing relapses, but it can only be safely administered under medical supervision. W. T. Dawson<sup>22</sup> records an interesting account of cinchona alkaloids with numerous references to the literature.

REFERENCES.—<sup>1</sup>*Ind. Med. Gaz.* 1931, Jan., 1; <sup>2</sup>*Ind. Jour. Med. Research*, 1930, Dec., Memoir No. 18; <sup>3</sup>*Ind. Med. Gaz.* 1930, Oct., 576; <sup>4</sup>*Records of the Malarial Survey of India*, 1930, Oct., i, No. 3; <sup>5</sup>*Jour. Trop. Med. and Hyg.* 1930, Dec. 1, 349; <sup>6</sup>*Ind. Jour. Med. Research*, 1930, Oct., 533; <sup>7</sup>*Jour. Trop. Med. and Hyg.* 1930, Dec. 1, 349; <sup>8</sup>*Ind. Med. Gaz.* 1930, Dec., 701; <sup>9</sup>*Ibid.* 671; <sup>10</sup>*Trans. Roy. Soc. Trop. Med. and Hyg.* 1931, March 13, 477; <sup>11</sup>*Ibid.* 1930, Nov. 25, 331; <sup>12</sup>*Amer. Jour. Trop. Med.* 1931, Jan. 1; <sup>13</sup>*Trans. Roy. Soc. Trop. Med. and Hyg.* 1931, April 25, 649; <sup>14</sup>*Amer. Jour. Trop. Med.* 1931, March, 145; <sup>15</sup>*Ibid.* 147; <sup>16</sup>*Ind. Med. Jour.* 1931, Jan., 1; <sup>17</sup>*Ind. Jour. Med. Research*, 1931, Jan., 831, 845, 855, and 871; <sup>18</sup>*Ind. Med. Jour.* 1930, Nov., 603; <sup>19</sup>*Lancet*, 1931, ii, 841; <sup>20</sup>*Amer. Jour. Trop. Med.* 1931, July, 279; <sup>21</sup>*Jour. R.A.M.C.* 1931, ix, 321 and 410; <sup>22</sup>*Ibid.* March, 178.

## MEASLES.

J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—According to the Monthly Epidemiological Report issued by the Health Section of the League of Nations,<sup>1</sup> a study of measles morbidity in various countries such as Bulgaria, Denmark, Hungary, Italy, Norway, Poland, and Switzerland, shows marked fluctuations in the incidence of the disease from year to year. The fatality-rate, however, still remains high, especially in England and Wales, Germany, and France, where measles is the most fatal infectious disease of childhood. Both in France and in England and Wales 90 per cent of the deaths from measles occur in the 0-4-year group. The great majority of the fatal cases in the first year of life die between the ninth and twelfth month. Owing to the lesser degree of vitality of male infants measles is more fatal in male than in female infants. Apart from clinical considerations the high fatality of measles can be explained by lack of care and unsatisfactory housing conditions, especially overcrowding and illegitimacy.

In dealing with the incidence and fatality-rate of measles in Egypt, S. Pacha<sup>2</sup> states that in some years the disease is ten times more fatal than diphtheria, the other infectious diseases of childhood causing only an insignificant mortality. In most years the case-mortality is 40 per cent. Measles usually appears in Egypt in the spring, and attacks both sexes indiscriminately. It is most prevalent between the ages of 1 and 4 years, and then in persons over 20.

L. R. Lemprière<sup>3</sup> records an outbreak of measles in a public school of 530 pupils, of whom 115 were not protected by a previous attack. Although, therefore, 90 to 100 might have been expected to contract the disease, only 14 actually did. The incubation period was remarkably long, being on the average sixteen days, while in 6 cases it was between seventeen and twenty days. All the cases were mild.

**SYMPTOMS AND COMPLICATIONS.**—O. W. Frewin<sup>4</sup> refers to the case of *measles in old age* reported by Hall (see MEDICAL ANNUAL, 1931, p. 307), and records a case in a man aged 71, complicated by bronchopneumonia and severe conjunctivitis. Recovery took place, although the patient became almost blind in the left eye.

P. R. Meyer and R. M. Greenthal<sup>5</sup> describe four cases of the rare condition known as *illness of infection* (see MEDICAL ANNUAL, 1926, p. 312; 1930, p. 335), in which a few hours after exposure to measles a child shows physical signs such as fever, coryza, conjunctival injection, and even a morbilliform rash, which all disappear in a day or two, but at the end of the incubation period undoubted measles develops. Further observations are still required to determine whether the 'illness of infection' is an actual clinical entity or a non-specific coincidence.

In view of the rarity of *second attacks of measles* (see MEDICAL ANNUAL, 1926, p. 313; 1928, p. 281), the case reported by H. Liebig<sup>6</sup> is of interest. A boy, age 3 years, had a recurrence of the disease a month after the first attack. The diagnosis of measles on the first occasion was based on the character of the eruption, its long duration, the well-marked catarrhal symptoms, the typical leucopenia and displacement to the left, and the positive diazo reaction. No Koplik's spots were seen, but their absence was attributed to the fact that the child was not admitted to hospital before the eruptive stage. On the second occasion the diagnosis was based on the presence of Koplik's spots, catarrhal symptoms, character of the eruption, leucopenia, and diazo reaction.

J. L. Kohn and H. Koiransky<sup>7</sup>, in a paper on the *chest after measles*, report their observations on re-examination of the children from 6 to 10 months after measles on whom they had previously described their findings before, during, and directly after the attack (see MEDICAL ANNUAL, 1931, p. 307). Little or no residual changes were found at the site of previous pulmonary infiltrations, but the evidence of pleural involvement during measles at the site of the interlobar fissures or elsewhere was striking, and was often present in clinically mild cases.

V. Angelini<sup>8</sup> reports a case of measles in a girl, age 5 years, complicated by *diabetes insipidus*. The amount of urine passed in the twenty-four hours ranged from 5200 to 7600 c.c., micturition occurring about nineteen times a day. The specific gravity varied from 1003 to 1004, and the chlorides from 4.27 to 7.32 gm. as compared with the normal 8.68 to 13.49 gm. The fundi and sella turcica were normal. The case did not come to autopsy, but the condition was probably due to an organic lesion of the dienecephalon and hypophysis caused by the measles virus.

Under the term *pseudo-tuberculous measles pneumonia*, W. Mikulowski<sup>9</sup> describes a frequent complication of measles in young children characterized by its protracted course, dilatation of the bronchi, and involvement of the pleurae with a microbial effusion of serous, fibrinous, or purulent character closely simulating pulmonary tuberculosis. A diagnosis of tuberculosis, however, can only be made by biological tests or direct bacteriological examination of the patient's sputum or excretions.

According to M. Lioret,<sup>10</sup> who records ten cases in patients aged from 3 to 40, *meningitis* is a rare complication of measles apart from local causes, especially otitis. It is most likely to occur when the eruption is beginning to fade, and

is accompanied by rise of temperature and constitutional disturbance but without signs of severe nervous involvement. The cerebrospinal fluid shows a mononuclear reaction suggesting tuberculous meningitis, although laboratory examinations are negative. The meningeal symptoms rapidly disappear and leave no sequelæ. The etiology is obscure, but it is reasonable to attribute the condition to the measles virus.

**PROPHYLAXIS.**—R. Debré, H. Bonnet, R. Broca, J. Florand, and Cros-Decam<sup>11</sup> distinguish three groups of cases in which **Convalescent Serum** has been given for prophylaxis, viz.: (1) Those in which the attack of measles is absolutely prevented and no permanent immunity ensues; (2) Those in which an attenuated attack occurs and the subsequent immunity is permanent; and (3) Those in which the attack has been too much attenuated for immunity to be of long duration. In such cases the child may have another attack the next year on exposure to infection. The writers, however, record cases showing that attacks of measles occurring one or two years after abortive attacks are milder than the usual form and may terminate abruptly. It is at present impossible to say how long this partial immunity lasts.

Acting on the principle that the protective power of the blood of an individual who has once had measles may be reactivated when he comes in contact with measles patients or carriers of the virus, W. Knoepfelmacher and J. Stross<sup>12</sup> attempted reactivation of the serum of adults who had had measles by injection of 5 to 10 c.c. of measles blood taken from patients on the first day on which the eruption appears on the face. Three injections were given with an interval of a week or fortnight between each injection. A week after the last injection the reactivated blood was taken from the donors, tested for sterility, and left in 5-c.c. ampoules until ready for use, the prophylactic dose being 5 to 10 c.c. Of 115 children exposed to measles who were given such injections, 85, or 73 per cent, escaped the disease. This result, though inferior to that obtained with convalescent serum, which it is often difficult to secure, is better than that afforded by non-activated adult serum.

**REFERENCES.**—<sup>1</sup>*Monthly Epid. Rep. Health Sect. League of Nat.* 1930, 449; <sup>2</sup>*Bull. Off. internat. d'Hyg. publ.* 1930, 1893; <sup>3</sup>*Brit. Med. Jour.* 1931, i, 14; <sup>4</sup>*Ibid.* 58; <sup>5</sup>*Arch. of Pediatrics.* 1930, 399; <sup>6</sup>*Med. Klinik.* 1930, 968; <sup>7</sup>*Amer. Jour. Dis. Child.* 1931, xli, 501; <sup>8</sup>*Clin. Pediat.* 1930, 992; <sup>9</sup>*Arch. de Méd. des Enf.* 1930, 711; <sup>10</sup>*Thèse de Paris*, 1930, No. 484; <sup>11</sup>*Bull. Soc. méd. Hôp. de Paris*, 1930, 1055; <sup>12</sup>*Wien. klin. Woch.* 1931, 213.

## MECKEL'S DIVERTICULUM, AFFECTIONS OF.

A. Rendle Short, M.D., F.R.C.S.

Although inflammation of Meckel's diverticulum is no doubt rare, W. L. Wolfson and M. J. Clurman,<sup>1</sup> of Brooklyn, have seen six cases in two years. The symptoms are like those of acute appendicitis, with marked toxæmia, and obstruction symptoms. All recovered after operation.

H. von Haberer<sup>2</sup> reports two cases of ulcer in or at the site of Meckel's diverticulum, leading to peritonitis by perforation in one case, and to bleeding in the other.

**REFERENCES.**—<sup>1</sup>*Ann. of Surg.* 1930, Sept., 388; <sup>2</sup>*Deut. Zeits. f. Chir.* 1930, July, 131.

## MENTAL DISEASES. (See also ALCOHOL AND DRUG ADDICTION; CHILDHOOD, PSYCHOPATHOLOGY OF; PSYCHONEUROSES)

Henry Devine, M.D., F.R.C.P.

**Treatment of the Psychoses.**—W. J. Bleckwenn<sup>1</sup> writes on *narcosis* as a therapeutic agent in neuropsychiatric conditions. By narcosis he means a state of deep sleep or unconsciousness, more or less prolonged, and quite rapidly induced by means of drugs; a condition similar to the state of general

anæsthesia necessary for surgical operations, but not so profound. The view is taken that disordered sleep, which is a common condition in the neuroses and psychoses, adds to the gravity of the situation, for sleep is essential to maintain life. With such views in mind he has endeavoured to utilize means of inducing states of physical and mental relaxation such as are observed in normal sleep, hoping thereby to favour the natural restorative processes. The drug used for the induction of periodic narcosis was **Amytal** (sodium iso-amylethyl-barbiturate). The following is the technique of administration utilized by the writer: The patient has no food for from four to six hours preceding drug administration. The drug is dissolved in freshly-distilled water. A 5 per cent solution is made. Each cubic centimetre thus contains  $\frac{3}{4}$  gr. of the drug. The freshly-made solution is injected intravenously at a rate not to exceed 1 c.c. per minute. It is necessary to use a watch for this, since it is difficult to inject accurately from 10 to 20 c.c. over a period of from ten to twenty minutes without the hesitating, jerky type of injection. The initial dose is individual, and for psychiatric cases it is absolutely safe, the writer states, to give 2 c.c. ( $1\frac{1}{2}$  gr.) more than is necessary to produce corneal anæsthesia. The abolition of the corneal reflex is used as the criterion of proper narcosis, and an additional  $1\frac{1}{2}$  gr. is given. Thus the average neuropsychiatric patient will receive between 7 and 15 gr. intravenously. This is approximately half the amount used for surgical anæsthesia. The drug may be used intramuscularly, in which event the dosage is increased and the solution is more concentrated. A 20 per cent solution is prepared, and of this is given from 2.5 to 5 c.c., or from 10 to 20 gr. In mild cases the drug can be used orally in doses of from 3 to 6 gr. It takes about forty minutes to be effective. The patient must always be watched by a nurse from the time of administration until the initial narcosis wears off. This precaution is advisable because of the dangers of aspiration of vomitus and, further, because of the depths of narcosis and the danger of suffocation. Caution is advised in the use of iso-amylethyl-barbiturate in cases of advanced arteriosclerosis. The writer has used this treatment in 184 cases, and has found that it will induce narcosis in the various types of excitement, benign depressions, and convulsive states. He is of the opinion that induced narcosis is decidedly beneficial in these cases, simplifying the management and materially shortening the course of the illness. It should be understood that the aim of this treatment is to produce cyclic sleep similar to that of normal sleep. Thus this method is to be distinguished from the **Somnifen** treatment (see MEDICAL ANNUAL, 1926, p. 257), which is intended to induce a prolonged twilight sleep lasting several days.

G. F. Peters<sup>2</sup> writes on the therapeutic effect of **Assisted Respiration** in established cases of *dementia præcox*. In the MEDICAL ANNUAL, 1930, p. 338, we gave a summary of the work of Loevenhart and others upon the effects of respiratory stimulation by means of carbon dioxide in the case of advanced katatonic subjects. The results were very striking since the patients thus stimulated 'woke up', as it were, and were able for a short time to carry on conversations, regressing back, however, into stupor as the effects of the stimulation passed off. This work was correlated with the researches of Golla, which showed that in certain psychotics there is a marked reduction in the sensitivity of the respiratory centre. Peters has now endeavoured to explore a line of treatment based upon the results of these various researches, and with this object in view he has treated a number of female patients suffering from *dementia præcox* by a process of what he terms 'assisted respiration', the technique of which is as follows: Sylvester's method of artificial respiration with minor modifications was carried out for a quarter of an hour daily. The object aimed at was to reinforce the patient's respiratory movements so

as to eliminate carbon dioxide without the patient's 'acidity' being at the same time increased by violent exertion on her part. A pause was made after every five inspirations, and a complete natural respiration observed before the assisted respiration was again commenced. The patient's natural breathing-rate was noted before the assisted respiration was again commenced. The patient's natural rate of breathing was noted at the start, so that the assistance could be made to synchronize with it. The pause enabled any readjustment to be made, so that the patient's natural respiration was assisted by the method instead of being replaced by it; it also gave the operating nurse a rest and provided the opportunity for a relay. As the patient's volition increased, breathing exercises, swinging the arms in time to music, exercise with the medicine-ball, and gymnastics were introduced into the course. Dancing was permitted, but skipping was found unsuitable after a trial. These measures were an automatic check on unjustified optimism, because the patients were unable to perform activities of increasing complexity unless they had reached the necessary standard of improvement. In the later stages games in the style of net-ball were devised, and the guiding principle throughout, so far as exercises were concerned, was to get the patient to carry out the equivalent of artificial respiration on herself. Step by step with the games and exercises tasks were allotted to the patient. These began with attention to personal hygiene. Then followed helping in the ward, leading on to definite work in the laundry or needle-room, or to more specialized forms of occupational therapy. Attainment to full social activity was the ultimate goal. The results of treatment appear to justify its use, for it was found that assisted respiration had the effect of changing the patient's condition for the better in 10 cases out of 12. It seemed to provide the first step towards the re-establishment of contact with social activity. It broke the spell of dissociation, and brought their environment into touch with them in a form that was insistent, but not irritating. It helped them—without much initiative on their part—to emerge from the cocoon of phantasy in which they had been wrapped, and the transition was made as smoothly as possible. Improvement has been shown chiefly on the conative side, unemployable and helpless patients becoming capable of employment and of attending to themselves. It was also noticed that there was a tendency for impulsive attacks to give place to harmless, but somewhat mischievous, pranks, especially as the result of example. Generally speaking, there was less change in the cognitive and affective spheres, except that the patients would answer more readily and accurately when spoken to, and also exhibit more emotionally appropriate responses.

D. Macmillan and A. M. Wyllie<sup>3</sup> record the results of the treatment of confirmed psychotics by the injection of *agents provoking a febrile reaction*. It is well known that febrile illness may cause a striking improvement in psychotic patients, and many attempts have been made to bring about favourable results of a similar kind by utilizing various agents for therapeutic purposes which stimulate a bodily reaction similar to that occurring in febrile states. In the present series 21 patients were treated with injections of a 1 per cent solution of **Sulphur in Olive Oil**. The injections were given in increasing doses, commencing with 1 c.c., and increasing each time by 1 c.c. They were given at approximately five-day intervals. The injections were made intramuscularly in the gluteal region. There was a pyrexial reaction accompanied by a leucocytosis in all the patients thus treated. The number of injections varied from three to ten. Recovery took place in 1 case of recurrent melancholia, and 7 cases could be regarded as improved. In none of these was the improvement marked, and in 5 of them it occurred some months after treatment. In another 22 cases sterile abscesses were produced

by the injection of one part of **Turpentine of Venice** and five parts of **Turpentine** into the deeper layers of the subcutaneous tissue of the antero-lateral aspect of the thigh. Fifteen cases were given turpentine alone, and 7 others received a subsequent course of **T.A.B. Vaccine** intravenously, the vaccine being administered as the temperature reaction due to the turpentine was subsiding. Only in 2 cases was the treatment entirely devoid of a beneficial effect, and the general impression given by the investigation is that this method of treatment in the psychoses is quite a potent therapeutic agent. In an acute recoverable benign type of illness the writers state that the good effect of turpentine is potent enough to accelerate the natural processes, and thereby perchance it may at a critical moment turn the balance in the patient's favour. The treatment of 5 cases with alopol, a preparation of sodium hydnocarpate used in the treatment of leprosy, did not result in any notable improvement.

**Prognosis in Schizophrenia.**—E. B. Strauss<sup>1</sup> points out that there are a number of conditions which exhibit schizophrenic symptoms, but which are not to be grouped amongst the true varieties of schizophrenia. Chief amongst these are certain forms of the psychoses of puberty and situational schizophrenia-like attacks. He takes the view that in the various forms of true schizophrenia there is present what may be called the 'schizophrenic process', which shows the actual activity of the disease, its organic physical nature, and its progressive direction towards the destruction and dissolution of the personality. The schizophrenic process is by no means always detectable; on the other hand, when it is recognizable, it is a certain sign that the patient is faced with depersonalization and disintegration. What form this will take, how complete it will be, and how soon it will occur, constitute the chief problems of the writer in his endeavour to establish some of the principles underlying the prognosis in true schizophrenia.

**Signs of the Schizophrenic Process.**—The cardinal pathognomonic indication of this process is the awareness of his illness by the patient as a change in himself, as a threat to his ego and its unity, as an experienced withdrawal of something from his personality and an accompanying sense of insufficiency. The frame of mind is therefore one of doubt and perplexity, accompanied by weird feelings of psychic dissolution. His subjective state is exhibited in his manner and facial expression, which always exhibit paradoxical features. He is cheerful and vivacious and yet at the same time not cheerful and vivacious, but, on the contrary, peculiarly stiff. Every expression seems at the same time to negative itself; a show of interest at the same time betrays a lack of interest. The whole psychomotility shows a motiveless restlessness which, in a mysterious kind of way, creates an impression of frozen immobility. A group of symptoms which are pathognomonic of the schizophrenic process are the physical sensations experienced by the patient—the peculiar and often bizarre paræsthesia, such as the feeling that one half of the body is expanded or shrunken, that the genitals are being tampered with, and so on. A single outstanding organic symptom of this type is of the gravest prognostic significance. The destructive schizophrenic process may come about in two ways—either (1) catastrophically, or (2) by means of a series of 'attacks'.

1. The *catastrophic type* is so termed because it terminates in dementia within from two to three years of the onset, after running a rapidly progressive course. It is relatively rare (about 15 per cent of the admissions of schizophrenic cases in the Marburg Klinik—all young people between the ages of 16 and 25). Many of these exhibit the symptomatology of the schizophrenic process in its most unequivocal form, especially the subjective consciousness of personal disintegration. This group is so well defined that Mauz proposes



the term 'schizokaria' to distinguish it, a term which implies that the destructive process involves the very core of the patient's being. The catastrophic process may manifest itself in two other forms—katatonic and hebephrenic. The paranoid, paraphrenic, oneiroid, and other forms of the disease are not met with in the schizophrenic catastrophe.

The *physical habitus* was in Mauz' large series of cases in no instance pyknomorphic—81.3 per cent were leptosomatic or athletosomatic, and 18.7 per cent were grossly dysplastic.

As regards the *prepsychotic personalities*, the *schizokariacs* belong almost exclusively to the higher and more intellectual levels of society ('highbrows'). The psychobiograms show that 99.6 per cent are predominantly autistic and introverted. The prepsychotic personalities of the *katatonics* do not fall into such clearly defined categories—katatonics are found in all walks of life. They invariably show schizoid characteristics, lacking warmth and versatility and adaptability, but, on the other hand, they do not exhibit the refined sensitivity of those in the schizokaric group. The prepsychotic personality of the *hebephrenics* is quite different. In childhood they are docile and sociable, and are often regarded as 'model' children. In 75 per cent of the series the impulsive life loomed larger than the rational. These people showed a tendency to naïve affective outbursts and primitive reaction-patterns, labile emotionally coloured modes of thought, and facile disinhibition.

2. The symptomatology of the *schizophrenic attack* is much richer than that of the catastrophic form. In addition to the three varieties met in the latter, there are the paraphrenic and paranoid forms, and those distinguished by syndromes such as hypochondriacal, obsessional, and hysterical symptom-complexes. In this group a proportion exhibit the pyknic body-build, a physical habitus which is incompatible with the catastrophic type of schizophrenia, according to the writer.

*Summary.*—To sum up the question of prognosis: This depends primarily on establishing the presence of the true schizophrenic background as an index of the schizophrenic process—a process which indicates the danger of permanent dementia. As regards the rapidity and completeness of the dementia, it would appear that a pyknomorphic habitus excludes a catastrophic destruction of the personality, whereas the other types of the disease physique increase the probability. Further, the degree of psychotic change is considerably lessened in persons previously showing a stable, well-defined attitude to the external world, with a temperamental background characterized by warmth, openness, conciliatoriness, and a sense of adequacy in the face of the demands of reality, versatility of activities and interests, and adaptability of aims and potentialities. The danger of a high degree of personal dissolution is increased by a pre-morbid constitution, exhibiting difficulty in adaptation to the outside world, a high degree of individualism, introversion, reserve, one-sidedness, and rigidity of aims and potentialities.

REFERENCES.—<sup>1</sup>*Jour. Amer. Med. Assoc.* 1930, ii, 1168; <sup>2</sup>*Jour. of Ment. Sci.* 1930, Oct., 662; <sup>3</sup>*Lancet*, 1931, i, 909; <sup>4</sup>*Proc. Roy. Soc. Med.* (Psychiat. Sect.) 1931, July, 27.

### MENTAL TREATMENT ACT, 1930. Henry Devine, M.D., F.R.C.P.

It is aimed in this article to indicate the main objects of the Mental Treatment Act, and also to outline the various methods which are now available, under the provisions of the Act, for dealing with mental patients whom the practitioner deems to be in need of mental hospital treatment.

The main object of the Mental Treatment Act is to bring the treatment of mental diseases into greater conformity with that of physical disease. Hitherto, with the exception of private and registered mental hospitals in

which it has been permissible to admit voluntary boarders, it has only been lawful to provide treatment in mental hospitals, for patients who could be dealt with by the legal process of certification which involves the Order of a magistrate. The new Act does not abolish certification, but it permits and encourages the treatment of certain types of severe but eminently recoverable psychoses without certification, and also makes it permissible for Local Authorities to provide accommodation for rate-aided patients who may wish to obtain treatment as voluntary patients. The Act aims at the treatment of mental disease before it has become fully established and perhaps incurable, and it affords increased flexibility in the arrangements for dealing with mental disease according to the degree and nature of the symptoms exhibited.

From the administrative standpoint three classes of patients are now recognized: (1) Voluntary patients; (2) Temporary patients; (3) Certified patients.

1. **Voluntary Patients.**—Section I of the Act provides that—"Any person who is desirous of voluntarily submitting himself to treatment for mental illness, and who makes a written application for the purpose, to the person in charge, may without a Reception Order, be received as a voluntary patient in an Institution within the meaning of this Act, or in any hospital, nursing home or place approved for the purpose of this Section, by the Board of Control, or into the charge of a person so approved, and any approval under this Section may be granted subject to such conditions as the Board think proper and may be revoked at any time."

Further points to be noted in regard to voluntary patients are :—

a. Persons under 16 years of age cannot be received as voluntary patients, except on the application of their parents or guardians; this application must be accompanied by a medical recommendation in due form. The medical recommendation must be signed by the usual medical attendant of the patient, or by a medical practitioner who has been approved for the purpose of making such a recommendation by the Board of Control or by the Local Authority within whose area the said patient then is. The practitioner must state his qualifications, the date or dates on which he examined the person, and that the said person is likely to be benefited by being received as a voluntary patient for mental illness. It is to be noted that no medical recommendation is required except in the case of a minor.

b. A voluntary patient may leave the hospital upon giving to the person in charge seventy-two hours' notice in writing.

c. Where any person received as a voluntary patient becomes incapable of expressing himself as willing or unwilling to continue to receive treatment, he must be discharged on the expiration of twenty-eight days, unless he has again become capable of expressing his wishes, or unless steps have been taken to deal with him under the Lunacy Act as a person of unsound mind, or under Section 5 of the Mental Treatment Act as a person who is likely to benefit by temporary treatment (*see below*).

From the above it will be seen that it is permissible to admit voluntary patients to County and Borough mental hospitals. Owing to the overcrowding and lack of suitable accommodation in some institutions it may not be immediately possible to admit many voluntary patients in some districts at the present time. No doubt this difficulty will be overcome in due course, and it will be found, as has been the case of the registered hospitals, that there is a steady decrease in the patients admitted under certificate, and a corresponding increase of those entering voluntarily. Experience has made it abundantly evident that many patients who exhibit psychotic symptoms of a pronounced type are quite capable of expressing the wish to enter a mental hospital for treatment.

**2. Temporary Patients.**—Section 5 of the Act provides that a person who is suffering from mental illness and is likely to benefit by temporary treatment, but who is for the time being incapable of expressing himself as willing or unwilling to receive such treatment, may on a written application duly made, and without a Reception Order, be received as a temporary patient for the purpose of treatment: (a) Into an institution maintained by a Local Authority; (b) Into a registered hospital; (c) Into any such other institution, hospital, or nursing home as may be approved by the Board of Control for the reception of such temporary patients; or (d) With the consent of the Board of Control into charge as a single patient.

An application for the reception of a temporary patient can normally be made only by a *near relative*, or by a *duly authorized officer of the Local Authority* in the case of rate-aided patients, and must be accompanied by two medical recommendations, one of which shall be given by a *medical practitioner approved for the purpose by the Board of Control*. A list of practitioners thus approved may be obtained from the printers under the authority of H.M. Stationery Office, Harrison & Sons, Ltd., St. Martin's Lane, London, W.C.2.

A copy of the application form required for the reception of a temporary patient is given below, as it is possible that many practitioners are unfamiliar with it.

#### FORM OF APPLICATION FOR RECEPTION OF A TEMPORARY PATIENT.

##### MENTAL TREATMENT ACT, 1930, SECT. 5.

1. I, \_\_\_\_\_ hereby request you to receive  
as a temporary patient into \_\_\_\_\_

2. I am related to the said \_\_\_\_\_ in the following  
manner :—

or,

I am the duly authorized officer of \_\_\_\_\_ The  
said \_\_\_\_\_ is now within the area of that authority  
and I make this application at the request of \_\_\_\_\_  
who is related to the said \_\_\_\_\_ in the following  
manner :—

or,

I am not related to the said \_\_\_\_\_ The  
reasons why this application is not made by a relative of the said \_\_\_\_\_  
, and my connection with him, and  
the circumstances under which I make this application, are as follows :—

3. Annexed hereto is a recommendation for the temporary treatment of  
the said \_\_\_\_\_, signed by \_\_\_\_\_

Signed,.....

Dated.....

To

RECOMMENDATIONS FOR TEMPORARY TREATMENT.

MENTAL TREATMENT ACT, 1930.

*Recommendation for the temporary treatment of*

I, \_\_\_\_\_ of \_\_\_\_\_ hereby declare  
that :—

1. I am a registered medical practitioner and have been approved for the purpose of making recommendations under section five of the above-mentioned Act by (the Board of Control) and I am not the usual medical attendant of the above-named.

2. I examined the said \_\_\_\_\_ on the  
day of \_\_\_\_\_ 19 \_\_\_\_\_

\*3. I have formed the conclusions stated below on the following grounds,  
viz. :—

I, \_\_\_\_\_ of \_\_\_\_\_ hereby declare  
that :—

1. I am a registered medical practitioner and am (am not) the usual medical attendant of the above-named.

2. I examined the above-mentioned \_\_\_\_\_ on the  
day of \_\_\_\_\_ 19 \_\_\_\_\_

\*3. I have formed the conclusions stated below on the following grounds,  
viz. :—

And we, the said \_\_\_\_\_ and  
further declare that :—

1. The said \_\_\_\_\_
  - (i) is suffering from mental illness ;
  - (ii) is likely to benefit by temporary treatment ;
  - (iii) is for the time being incapable of expressing himself as willing or unwilling to receive such treatment.

2. It is expedient with a view to the said \_\_\_\_\_'s  
recovery that he should be received into \_\_\_\_\_ for a  
period not exceeding six months.

*Signed*.....

*Medical Qualifications*.....

*Date*.....

*Signed*.....

*Medical Qualifications*.....

*Date*.....

\* A person, in specifying the grounds on which his conclusions are based, must carefully distinguish between statements of fact which are based upon his own observations and statements of fact which are based upon communications made to him by others.]

Within one month of the reception of a temporary patient he must be visited by at least two members of the visiting committee of the institution, who shall sign a statement that they are of the opinion that the patient should continue to be detained, or, alternatively, send a report to the Board of Control, giving their reasons why the patient should be discharged. It is to be noted that the Committee of Management of a registered hospital is not a visiting committee within the meaning of this Act. In the case of registered hospitals the patient must be visited by at least two of the visitors of licensed houses (private mental hospitals) for the district in which he is, of which visitors one must be a registered medical practitioner. In the area within the immediate jurisdiction of the Board of Control, the duty imposed by this section on the visitors of licensed houses shall be performed by the Board of Control.

A temporary patient must not be detained for longer than six months, unless it is anticipated that his early recovery is reasonably probable, in which case the period may, on the application of the person who made the original application, be extended for further periods not exceeding three months singly or six months in all.

A temporary patient ceases to be such in one of the following ways : (1) By recovery ; (2) If he becomes capable of expressing himself as willing or unwilling to continue to receive treatment he must be discharged within twenty-eight days, unless in the meantime he again becomes incapable of so expressing himself ; (3) The Board of Control may either direct the discharge of a temporary patient or direct that steps should be taken to certify him under the Lunacy Acts ; (4) In the case of a private patient the person who made the original application may direct his discharge, in the case of a rate-aided patient the paying authority may make an order for his discharge ; (5) Any three members of the visiting committee, or any two members acting on the written advice of the Medical Superintendent, may discharge a temporary patient.

The temporary treatment principle provides an entirely new method of dealing with patients with severe psychotic symptoms which necessitate their removal to a mental hospital or other suitable place. The main points about temporary patients is that the 'stigma' of certification is avoided and that they are received on the recommendation of medical practitioners and not under a Magistrate's Order. That is to say, they are received on purely medical grounds for treatment and not primarily because they are dangerous to themselves or others. A considerable number of patients who are now certified might be suitably treated as temporary patients in so far as they are recoverable and in a state of mind in which they are incapable of expressing the wish or otherwise for treatment. The subjects of acute puerperal psychoses, benign stupors, severe episodes of manic-depressive insanity, and the toxic-exhaustive psychoses would no doubt in many instances be found eminently suitable to be dealt with administratively under the category of temporary patient, and it is much to be hoped that this provision of the new Act will be taken advantage of as far as possible.

**3. Certified Patients.**—These are patients who have been dealt with in the past by the legal process of certification, and who will continue so to be dealt with. It is now possible under the Mental Treatment Act to make an Urgency Order in respect of a rate-aided patient. This remedies a deficiency in the Lunacy Act, under which the removal of a rate-aided patient to a mental hospital can only be effected after an Order of a Justice has been obtained, with the result that patients in need of immediate treatment had generally been removed to the workhouse. It will now be within the power of the authorized officer of the Local Authority, in urgent cases, to arrange

for the removal of a rate-aided patient, without the necessity of obtaining a Justice's Order, direct to a mental hospital.

There are many other points of administrative interest in the new Act, especially important being those concerning the increased powers it confers upon Local Authorities for making provision for the treatment of mild and incipient cases of mental disorder external to the mental hospitals. The main principles embodied in the new Act governing the future treatment of mental illness may be summarized as follows: (1) The preventive treatment of mental illness by the provision of out-patient clinics in connection with general and municipal hospitals; (2) The closer co-operation between the general and mental hospitals in order that the treatment of mental illness may be assimilated with that of other forms of disease; (3) Extended provision for after-care and for systematized research into mental illness.

The Mental Treatment Act (Section 16) affords some protection to those who are responsible for sending a mental patient, either 'certified' or 'temporary', to a mental hospital or other place of treatment. Thus it provides that the practitioner who signs a certificate or recommendation in the case of a mental patient who is sent to a hospital or institution shall not be liable to any civil or criminal proceedings, whether on the ground of want of jurisdiction or on any other ground, unless he has acted in bad faith or without reasonable care. Furthermore, no proceedings, civil or criminal, shall be brought against any person who has presented a petition for a reception order, or signed an order, or given a certificate or recommendation, without the leave of the High Court, and leave shall not be given unless the Court is satisfied that there is substantial ground for the contention that the person against whom it is sought to bring proceedings has acted in bad faith or without reasonable care.

**MESENTERIC LYMPHADENITIS.** (See LYMPHADENITIS, MESENTERIC.)

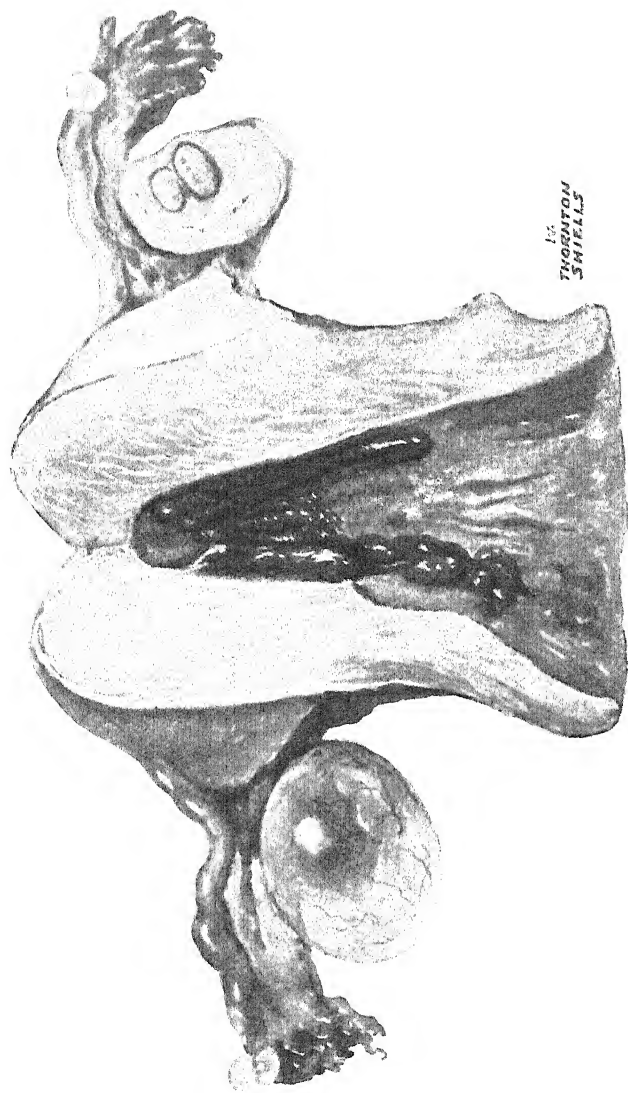
### **METROPATHIA HÆMORRHAGICA.**

*Beckwith Whitehouse, M.S., F.R.C.S.*

Of recent advances in gynaecological pathology one of the most important from the practical point of view is establishment of the relationship that irregular uterine hæmorrhage bears to ovarian pathology. Once more have chronic metritis, chronic subinvolution, and endometritis been thrown into the melting-pot, and the combined observations of various workers in the histological and physiological laboratories have led to a revision of the older views and terminology. W. Shaw<sup>1</sup> has emphasized the fact that only in a few cases can irregular uterine bleeding be attributed to infections of the endometrium. Acute endometritis, such as occurs after abortions or delivery at term, tends to be followed by spontaneous healing, and '*chronic endometritis*' is therefore a rare disease. Cases of true endometritis show pathological features precisely comparable with those of acute and chronic inflammation elsewhere. It is entirely wrong, therefore, to label a case as 'endometritis' unless it shows definite clinical or histological evidence of endometrial infection. As Shaw observes—and we are in entire agreement with him on this point—the majority of cases of uterine hæmorrhage have no relation whatever to infections of the endometrium.

Similarly a chronic inflammatory condition of the uterine musculature—in other words, '*chronic metritis*'—is extremely rare, and met with only in cases of gross infection of the pelvic viscera and degenerating malignant growths of the uterus. Chronic metritis as a common cause of irregular uterine bleeding is therefore to be disregarded, and the term not used lightly as a convenient

PLATE XLII—METROPATHIA HÆMORRHAGICA  
(W. SHAW)



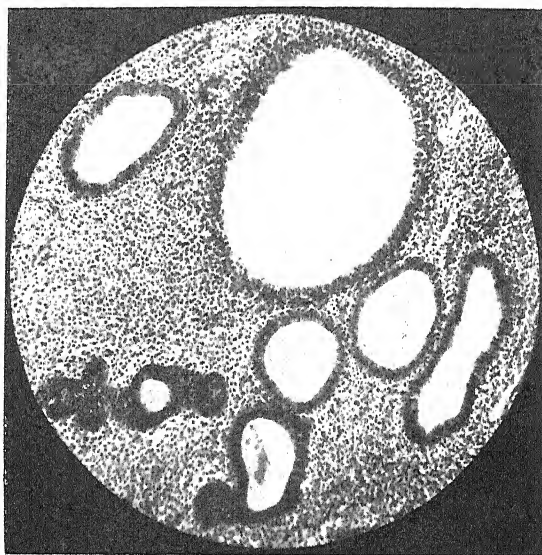
*Fig. 1.*—Uterus and appendages. The muscle wall of the uterus is thicker than normal. Large red polypoid projections from the endometrium protrude downwards. Their surfaces are smooth. The polypoid condition involves the greater part of the endometrium of the body, but does not encroach upon the cervical canal. The characteristic cyst is seen in the ovary on the left. The opposite ovary contains two ripening follicles.

*Plates XLII and XLIII by kind permission of the  
"Journal of Obstetrics and Gynaecology of the British Empire."*

*PLATE XLIII*

METROPATHIA HÆMORRHAGICA—*continued*

(W. SHAW)



*Fig. B.*—Microscopical section of the endometrium. The cysts are seen and also the dense hyperplastic stroma.



method of explaining symptoms. Such a policy, not based upon pathological findings, has done much to retard progress in the past.

The same destructive criticism has been levelled at '*chronic subinvolution*' in its relation to uterine hæmorrhage. W. Shaw has been unable to confirm the work of J. R. Goodall<sup>2</sup> on the involution changes in the vessels of the uterine wall, and finds no evidence of the growth of a new vessel within the lumen of the old vessel during the process of involution. It is true that the elastic tissue content of the uterus is increased after each pregnancy, but this is to be regarded as a physiological process entirely. There is no reason to believe that its deposition is in any way determined by subinvolution. Also there is no pathological reason to suppose that irregular bleeding from the uterus is determined by the amount of elastic or fibrous tissue present in its walls. The cause must be looked for elsewhere.

R. Schroeder<sup>3</sup> in 1915 and 1919 called attention to the association of 'persistent ripening follicles' in relation to abnormal uterine hæmorrhage, and correlated the ovarian findings with hyperplasia of the uterine endometrium under the term '*metropathia hæmorrhagica*'. R. Meyer,<sup>4</sup> O. Buettner,<sup>5</sup> E. Novak,<sup>6</sup> M. Beckman,<sup>7</sup> C. F. Fluhmann,<sup>8</sup> and W. Shaw<sup>1</sup> have since made important contributions on the same subject, and to-day '*metropathia*' is to be regarded as a clinical entity. In this disease the endometrium is thickened and in parts polypoid and hyperplastic. The uterine glands are dilated and cystic, and whilst hæmorrhage is in progress, areas of endometrial necrosis are present in the superficial and middle layers. In the ovaries evidence of disordered function is constantly present. Inhibition either of ovulation or development of the corpus luteum is found, and the affected follicle does not rupture. It becomes cystic and persists.

The pathological appearance seen in a typical case of metropathia hæmorrhagica are well shown in *Plate XLII*. The muscle wall of the uterus is thicker than normal. The endometrium is hyperplastic, and a polypoid condition involves the greater part of the endometrium of the body, but does not encroach upon the cervical canal. A characteristic cyst caused by an unruptured Graafian follicle is seen in the right ovary. The opposite ovary contains two ripening follicles. The microscopical appearance of the endometrium from a curetting in a case of metropathia is shown in *Plate XLIII*. The cystic glands and the dense hyperplastic stroma should be noted.

According to Shaw, 26.5 per cent of cases of 'irregular uterine hæmorrhage' admitted to St. Bartholomew's Hospital fall into the category of Schroeder's metropathia hæmorrhagica. In another large group ovarian disturbances can be demonstrated, showing that ovulation occurs more frequently than normal and that the menstrual rhythm is upset. In these cases the endometrium is hyperæmic and œdematous, but not hyperplastic as in 'Schroeder's disease'.

It will be seen, therefore, that in the light of recent investigations the centre of interest in cases of uterine hæmorrhage without gross physical signs has been transferred from the uterus to the ovary. The bleeding is regarded as evidence of disordered ovarian physiological function. A natural corollary, therefore, is that an explanation of the pathological appearances has been looked for in a disturbance of the endocrines normally involved in healthy ovulation. J. Hofbauer<sup>9</sup> has recently shown that in guinea-pigs treated with derivatives of the anterior pituitary conditions may be produced in the uterine mucosa and in the ovaries which are practically identical with those observed in endometrial hyperplasia in women. When the ovaries were removed the process was limited to the basal portion of the endometrium only. Hofbauer suggests, therefore, that endometrial hyperplasia may reasonably be regarded as the

manifestation of over-activity of the anterior pituitary lobe, and advocates the application of **X Rays** to the pituitary to suppress its excessive activity.

C. W. Corner and W. M. Allen<sup>10</sup> hold the view that the integrity of the entire endometrium depends upon the influence of the ovarian hormones developed first in the follicle and later in the corpus luteum. Hoffbauer's observations seem to indicate, however, that the internal ovarian secretion is essential for the changes in the superficial part of the uterine mucosa only, and that the basal layer is controlled by the anterior lobe of the pituitary, as judged by the response of the 'basal layer' to pituitary administration in ovariectomized animals.

It is now generally agreed that apart from pituitary influence the ovary produces at least two hormones, the follicular and the luteal, and that the latter is responsible for the definite transformation of the cells of the stroma and glands of the endometrium to constitute the so-called pre-menstrual phase or menstrual decidua.

Fluhmann<sup>8</sup> thinks that pathological endometrial hyperplasia, such as occurs in metropathia hemorrhagica, occurs as the result of over-stimulation of the endometrium by the follicular hormone and the complete absence of the luteal secretion—a conception which is in accordance with Schroeder's teaching.

REFERENCES.—<sup>1</sup>*Jour. Obst. and Gynecol. Brit. Emp.* 1929, xxxvi, 1; <sup>2</sup>*Studies from the Royal Victoria Hospital, Montreal*, 1910, ii, No. 3; <sup>3</sup>*Arch. f. Gynäk.* 1912, xlviii, 81; 1915, civ, 27; and 1919, ex, 633, and *Veit-Stoeckel's 'Handbuch der Gynäkologie'*, 1928, i, part 2, Munich; <sup>4</sup>*Arch. f. Gynäk.* 1920, cxiii, 259; <sup>5</sup>*Ibid.* 1910, xcii, 781; <sup>6</sup>*Amer. Jour. Obst.* 1917, lxxx, 996; <sup>7</sup>*Arch. f. Gynäk.* 1929, cxxxv, 519; <sup>8</sup>*Amer. Jour. Obst. and Gynecol.* 1931, xxi, 455, and *Surg. Gynecol. and Obst.* 1929, xlviii, 425, and 1931, lii, 1052; <sup>9</sup>*Ibid.* 1931, lii, 222; <sup>10</sup>*Amer. Jour. Physiol.* 1930, xcii.

**MIDWIFERY, ANTISEPTICS IN.** (See LABOUR AND ITS COMPLICATIONS.)

**MINERS' NYSTAGMUS.** (See NYSTAGMUS.)

**MONILIASIS.** (See SKIN, FUNGUS AFFECTIONS OF.)

## MUMPS.

J. D. Rolleston, M.D., F.R.C.P.

**SYMPTOMS AND COMPLICATIONS.**—E. H. R. Harries and E. C. Benn<sup>1</sup> record two cases of sublingual mumps with *œdema of the tongue* in a boy aged 8 and a girl aged 13, respectively. Uncomplicated recovery took place in both cases. No previous example of œdema of the tongue secondary to sublingual mumps appears to have been described.

M. B. Brahdy and I. H. Scheffer<sup>2</sup> state that of 252 mumps cases admitted to the Willard Parker Hospital, New York, between Jan. 1, 1929, and March 1, 1930, 13 developed *pancreatitis* from three to nine days after admission: 5 were males and 8 females. The youngest was aged 6 and the oldest 30, the average age being 17. The pancreatitis appeared from the fifth to the eleventh day of disease, the average time being the seventh day. With the exception of one man who had orchitis, none had any other complications. The chief symptoms were epigastric pain and tenderness, vomiting, and fever. There was no diarrhoea or steatorrhœa, and the urine was free from sugar in every case. All the patients recovered. (See also MEDICAL ANNUAL, 1923, p. 299.)

J. M. Ortega,<sup>3</sup> who records two cases, illustrates the rarity of *iritis* as a complication of mumps by the fact that, since this complication was first described by Combeau in 1867, not more than half a dozen examples have been described. Ortega's patients were soldiers in whom bilateral iritis occurred in one while the parotid swelling was still present, and in the other ten days after the onset. All other causes for the iritis could be excluded. One patient made a complete recovery, while the other had some impairment of vision due to formation of synechiæ.

E. Esquivel<sup>4</sup> records seven cases of mumps complicated by enlargement of the *thymus*. No X-ray examination was made, but the diagnosis was based on the increased dullness on both sides of the manubrium and marked bulging over the suprasternal notch. The thymus swelling appeared simultaneously with or after the parotid swelling, lasted three or five days, and then disappeared. J. D. Rolleston<sup>5</sup> points out that the complication had previously been described by J. Sailer in 1919.

A. Spence<sup>6</sup> reports a severe case of mumps in a middle-aged man complicated by *urethritis* in which no gonococci could be found, as well as by orchitis and pancreatitis. F. Kidd<sup>7</sup> states that he has seen several similar cases of urethritis in mumps complicated by orchitis. [The complication is, nevertheless, rare, as no example has come under the reviewer's notice.—J. D. R.]

REFERENCES.—<sup>1</sup>*Brit. Jour. Child. Dis.* 1930, 293; <sup>2</sup>*Amer. Jour. Med. Sci.* 1931, clxxxi, 255; <sup>3</sup>*Arch. de Med. Cir. y Esp.* 1930, 358; <sup>4</sup>*Jour. Philippine Islands*, 1930, 316; <sup>5</sup>*Brit. Med. Jour.* 1930, ii, 1072; <sup>6</sup>*Ibid.* 1931, i, 751; <sup>7</sup>*Ibid.* 816.

### MURMURS, CRANIAL. (See CRANIAL MURMURS.)

### MURMURS, PRECORDIAL VENOUS. A. G. Gibson, M.D., F.R.C.P.

N. B. Gwyn<sup>1</sup> draws attention to the venous murmurs over the heart that sometimes occur in advanced cases of cirrhosis of the liver with the compensatory circulation between the portal and systemic venous circulations. The cases are sometimes mistaken for congenital hearts with a patent foramen

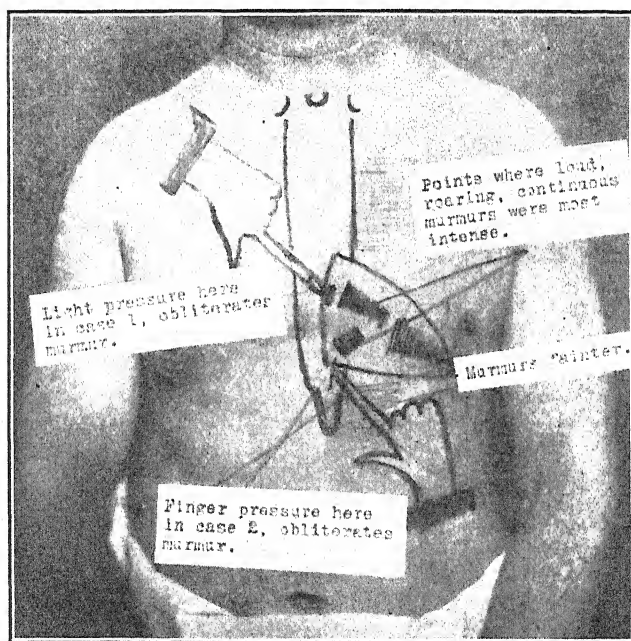


Fig. 68.—Diagrammatic sketch, showing the situation of fissures in the sternum and points at which the murmurs were best heard in the two cases reported. These fissures, which result from some disturbance of the proper process of ossification in the sternal segments, are very common. A developing collateral circulation in the course of cirrhosis would be very likely to find a way through any such deficiency. (Figs. 68 and 69 by kind permission of the 'American Journal of the Medical Sciences'.)

ovale, but are readily distinguished by the fact that pressure over a point on the sternum abolishes the murmur. The murmur depends upon the fact that an accessory vein from the superior abdominal region enters a foramen in the sternum to reach the internal mammary vein. Light pressure put upon this foramen obliterates the murmur. The author's two figures here reproduced

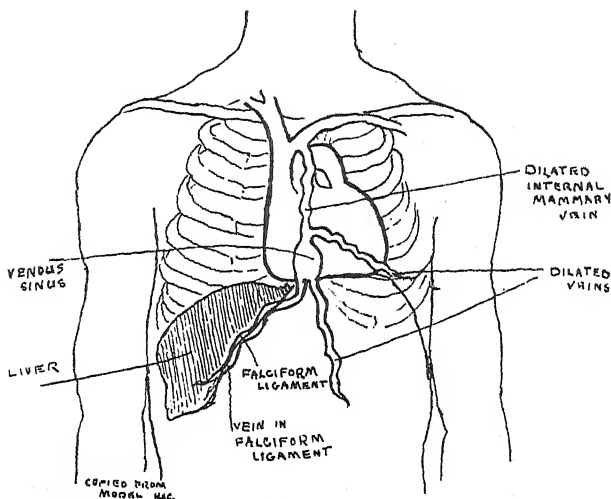


Fig. 69.—Diagrammatic representation of conditions which may be present in some instances of well-developed collateral circulation and of the condition found in author's *Case 2*. The liver and falciform ligament are indicated, as is the vein coming from the ligament through the diaphragm. The venous sinus is roughly represented as lying over the lower part of the right ventricle. The venous trunk, the enlarged internal mammary vein leading from it up over the heart and joining with the innominate vein, is seen to pass directly over the heart area. The production of a murmur directly over the heart would be explained by the existence of this abnormality in the venous circulation, particularly if into this sinus was emptying a vein which coursed through the sternum.

(Figs. 68, 69) will explain the mechanism. Two cases have been observed by the author, in the earlier of which, published in 1912 with J. N. Henry, dissections revealed the cause of the murmur. The second case was observed clinically, but corresponds to the features observed in the first.

REFERENCE.—<sup>1</sup>*Amer. Jour. Med. Sci.* 1930, Oct., 525.

**MYELOMA, MULTIPLE.** (See BONE TUMOURS; PARATHYROID GLANDS.)

### MYOCARDITIS.

A. G. Gibson, M.D., F.R.C.P.

C. E. Chapelle<sup>1</sup> refers to the rare cases of myocarditis sometimes known as *Fielder's myocarditis*, from the first clear description of it given in 1890. Post mortem the myocardium shows disseminated patches of round-cell infiltration with destruction of the muscle fibres or their healed fibrous equivalent. The anatomical appearances are unlike those of acute rheumatism, and the endocardium and pericardium are not affected. Also the descriptions of the minute anatomy do not respond to rheumatic myocarditis. The clinical features so far described appear to indicate that diagnosis during life is possible. No common etiological factor has been discovered; the absence of usual infective complaints is noteworthy. The disease occurs in young men in the third decade, and there is abrupt onset with embolic, pulmonary, or cerebral

manifestations, followed by progressive myocardial failure. In the case here described, a man of 21 fell while riding a bicycle; there was probably some unconsciousness, and on removal to hospital the patient was found to have hemiplegia. This cleared up in the course of three months, and he became practically normal except for slight weakness of the left hand. Five months after this he suffered from a cough, which grew worse. From the second week he expectorated blood-stained sputum and had pain in the lower right chest. There was some shortness of breath on exertion. On admission to hospital the cough had practically disappeared, there was no fever, no loss of weight, and no chill, but the patient had noticed swelling of the feet for the previous week. The man was ill, but well nourished, slightly dyspnoeic, and with orthopnoea. His colour was that of *café au lait*. There was no evidence of hæmorrhage or exudates. Respirations were 32 per minute. There were signs of fluid in the right chest. There was a leucocytosis of 10,000 and a mild grade of secondary anaemia. The blood cultures were negative. The electrocardiogram showed a moderate degree of A.-V. block. The patient became progressively worse, the œdema increased, cyanosis was intermittent, and he died of congestive cardiac failure, with the usual accompaniments. There was a complete post-mortem, and microphotographs are given in illustration.

J. Cowan<sup>2</sup> contributes an important review of the *fibroses of the heart*. We are accustomed to make use of the term 'myocarditis' in clinical medicine somewhat loosely. In this article Cowan brings together the different forms of that process and points out the method of diagnosis. (1) The first type is seen as a result of acute myocarditis from infective endocarditis, pyæmic conditions, and in many of the acute infections such as pneumonia, enteric fever, and diphtheria. In this group he places the myocarditis of acute rheumatism. (2) The ischaemic fibrosis which is dependent on the occlusion of one of the coronary arteries. (3) Syphilitic lesions, gummata, diffuse fibroses, and arterial lesions similar to the second type. In regard to the recognition of these lesions the most easily recognizable are the dramatic attacks of ischaemic necrosis of the myocardium. In the acute infective diseases the evidence lies mainly in disturbances of rhythm, heart-block in various degrees, and nodal rhythm. In rheumatic fever myocarditis is an inference from alterations in the valves. In non-infective disease progressive cardiac failure without obvious cause is always suggestive of myocarditis. The minor degrees of this affection are recognized by the condition of the electrocardiogram. Bundle branch block is one of the conditions identified mainly in this way. In the more chronic lesions the diagnosis may often depend on a very careful history of the reaction of the patient to exercise and other variations of life.

REFERENCE.—<sup>1</sup>*Arch. of Internal Med.* 1931, June, 942; <sup>2</sup>*Lancet*, 1930, ii, 1.

## MYOPATHY.

Macdonald Critchley, M.D., F.R.C.P.

Ken Kuré and Shigro Okinaka<sup>1</sup> have recently advocated the prolonged administration of **Adrenalin** and **Pilocarpine** for the palliative treatment of the muscular dystrophies. Subcutaneous injections of 0.2 to 0.3 c.c. of a 1-1000 solution of adrenalin, together with 0.1 to 0.2 c.c. of a 1 per cent solution of pilocarpine, are given daily or on alternate days up to fifty injections in all. No ill effects have been observed other than a temporary tachycardia and palpitation. Twelve patients have been so treated, and an increase in the power of the affected muscles was claimed in two or three hours, persisting for about twelve. In two cases "almost complete recovery with relief of symptoms" was observed; six other patients improved.

Persistent increase in power was observable in most instances after fifteen to thirty injections had been given, and this improvement might be maintained for some months after the discontinuance of the drugs. No improvement whatever was seen in a few patients, and the authors advise the injections to be stopped if no betterment is seen after fifty doses. Even in those patients whose muscular strength did not improve, the progress of the disease seemed arrested.

REFERENCE.—*Klin. Woch.* 1930, ix, 1168.

## NÆVI. (See INJECTION TREATMENT.)

## NARCOLEPSY.

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J. B. Doyle and L. E. Daniels<sup>1</sup> have recently reviewed the subject of treatment in narcolepsy. The general experience has been that luminal and bromides are of little avail in this condition, despite reports to the contrary by M. Serejski and Y. Frumkin.<sup>2</sup> **Caffeine** was originally advocated by Gowers<sup>3</sup> and has received an extensive trial. The results have, on the whole, proved unconvincing, though Hilpert<sup>4</sup> believed his patient was benefited by caffeine administered during the day, together with **Luminal** (phenobarbital) at night. **Thyroid Extract** has been suggested, either alone or in combination with other endocrine preparations; **Pituitary Extract** has been recommended by Ratner<sup>5</sup> and Beyermann.<sup>6</sup> Doyle and Daniels call attention to the use of **Ephedrine Sulphate** in this disorder; they have treated 6 patients in all; 5 were completely relieved of the essential symptoms of irresistible desire to sleep, and of cataplexy. The sixth patient was relieved of cataplexy and hypnagogic hallucinations, while the attacks of somnolence were markedly improved. Small doses are advisable, the amount being gradually increased, and it is well to make the last dose a small one and to give it no later than 4.30 or 5 p.m. in order to prevent insomnia.

REFERENCES.—<sup>1</sup>*Jour. Amer. Med. Assoc.* 1931, April 25, 1370; <sup>2</sup>*Zeits. f. d. g. Neurol. u. Psychiat.* 1930, exxiii, 233; <sup>3</sup>*The Borderland of Epilepsy*, 1907, London; <sup>4</sup>*Klin. Woch.* 1928, Aug. 6, 1553; <sup>5</sup>*Arch. f. Psychiat.* 1928, xxxvi, 528; <sup>6</sup>*Zeits. f. d. g. Neurol. u. Psychiat.* 1930, exxviii, 726.

## NASAL SINUSES, AFFECTIONS OF. (See also RADIUM TREATMENT OF CANCER.)

A. J. M. Wright, M.B., F.R.C.S.

**Maxillary Antrum.**—A very great deal of attention is being paid to the pathology and treatment of infections of this nasal sinus. The general impression conveyed is that we are experiencing one of those periodic waves of operative enthusiasm which inflict the nasal sinuses from time to time. At the same time it is gratifying to feel that much pathological research is being carried out, and it is to be hoped that this will provide a firm foundation on which to establish lines of treatment. In the past most observers have based their diagnosis of an infection of the antrum on the result of nasal examination, X rays, and, most important of all, on the result of proof puncture. J. Harper<sup>1</sup> is of the opinion that the very great majority of cases of recurrent 'colds' and nasal catarrh are due to an antral infection and that negative proof puncture is meaningless. In his opinion, in many cases of antral infection the pathological changes do not result in the formation of pus, but are characterized by a degeneration of the mucous membrane with the formation of excessive mucus discharge. He has submitted a large number of cases to operation, carried out through the canine fossa, and in the majority of these, although pus is absent, pathological changes are to be found in the lining membrane.

A. A. Eggston,<sup>2</sup> as a result of his pathological investigations into infections of the antral lining, recognizes three types: (1) A chronic hypertrophic type,

characterized by thickening and œdema of the mucosa with the presence of polypoid masses; (2) A chronic atrophic type, characterized by fibrosis of the lining; and (3) A mixed type, the result of a combination of the preceding ones, and characterized by a rugose mucosa.

J. G. Hunt,<sup>3</sup> largely as a result of the employment of lipiodol injections into the antra, with subsequent X rays, has come to the conclusion that the majority of chronic nasal catarrhs are due to antral infections. He attaches great importance to the thickening and degeneration of the lining and advises the complete removal of this lining in one piece through an opening in the canine fossa. He states that if this is done, the lining will be regenerated, and in support of this refers to experiments on dogs by Knowlton and McGregor.

P. G. Goldsmith<sup>4</sup> also states that infection of the mucosa of the maxillary antrum is responsible for most of the nasal complaints in his practice. He agrees that a negative proof puncture does not by any means rule out an infection of the mucosa, but as regards operation, he considers that the intranasal operation should be tried before resorting to operation through the canine fossa, with removal of the mucous membrane.

That removal of the whole lining of the antrum can be followed by the regeneration of an apparently normal ciliated lining has been shown by C. B. Gorham and J. A. Bacher.<sup>5</sup> They confirmed this regeneration by the examination of specimens of the lining removed at varying intervals from cavities from which the mucous membrane had previously been entirely removed.

As, to some extent, an offset to this enthusiasm for radical operations on the antrum through the canine fossa, D. Halle<sup>6</sup> has emphasized the drawbacks of such operation, particularly the division of the nerves and blood-vessels to the teeth and the occasional occurrence of post-operative neuralgia.

**Focal Infection.**—Several of the observers already quoted have emphasized the importance of maxillary sinus infections as a source of focal infection. C. M. Anderson<sup>7</sup> has investigated the importance of this question in 400 consecutive cases of antral sinusitis. He concludes that such a sinusitis is not a significant factor in focal infection. Thus, in 200 cases of sinusitis without other foci of infection, there were only 3 cases of rheumatism and one of bronchiectasis. In a second group of 200 cases with foci in one or more regions in addition to the nasal sinuses, one quarter presented complications which may have been caused by focal infection. He concludes that the post-nasal discharge of mucus and a vasomotor rhinitis are often diagnosed as sinusitis when no infection is present. He regards the teeth, tonsils, prostate gland, and other foci as more important than the nasal sinuses.

#### **Malignant Disease of the Nasal Sinuses.**—

**ETIOLOGY.**—In the great majority of cases of malignant disease of the nasal sinuses some degree of suppuration is present. While it has been generally taken for granted that this suppuration has resulted from the new growth, it has been pointed out by A. J. Wright<sup>8</sup> that this is not by any means always so. He relates a series of eight cases from his own practice, in all of which a chronic suppuration had preceded the onset of malignant disease by a considerable period. He therefore suggests that chronic infection in the accessory sinuses may be not infrequently an etiological factor in the occurrence of malignant changes. If this view is accepted, it raises two points of practical importance: First, it provides an additional argument for treatment and cure, when possible, of chronic sinus infections; and, secondly, the pre-existing suppuration tends to obscure the diagnosis of malignancy in its early stages.

**OPERATIVE TREATMENT.**—Certain general principles as to the prevention or repair of deformities resulting from the operative treatment of new growths of the nasal sinuses have been defined by E. M. Woodman.<sup>9</sup> To avoid unsightly

Persistent increase in power was observable in most instances after fifteen to thirty injections had been given, and this improvement might be maintained for some months after the discontinuance of the drugs. No improvement whatever was seen in a few patients, and the authors advise the injections to be stopped if no betterment is seen after fifty doses. Even in those patients whose muscular strength did not improve, the progress of the disease seemed arrested.

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As, to some extent, an offset to this enthusiasm for radical operations on the antrum through the canine fossa, D. Halle<sup>6</sup> has emphasized the drawbacks of such operation, particularly the division of the nerves and blood-vessels to the teeth and the occasional occurrence of post-operative neuralgia.

**Focal Infection.**—Several of the observers already quoted have emphasized the importance of maxillary sinus infections as a source of focal infection. C. M. Anderson<sup>7</sup> has investigated the importance of this question in 400 consecutive cases of antral sinusitis. He concludes that such a sinusitis is not a significant factor in focal infection. Thus, in 200 cases of sinusitis without other foci of infection, there were only 3 cases of rheumatism and one of bronchiectasis. In a second group of 200 cases with foci in one or more regions in addition to the nasal sinuses, one quarter presented complications which may have been caused by focal infection. He concludes that the post-nasal discharge of mucus and a vasomotor rhinitis are often diagnosed as sinusitis when no infection is present. He regards the teeth, tonsils, prostate gland, and other foci as more important than the nasal sinuses.

#### **Malignant Disease of the Nasal Sinuses.**—

**ETIOLOGY.**—In the great majority of cases of malignant disease of the nasal sinuses some degree of suppuration is present. While it has been generally taken for granted that this suppuration has resulted from the new growth, it has been pointed out by A. J. Wright<sup>8</sup> that this is not by any means always so. He relates a series of eight cases from his own practice, in all of which a chronic suppuration had preceded the onset of malignant disease by a considerable period. He therefore suggests that chronic infection in the accessory sinuses may be not infrequently an etiological factor in the occurrence of malignant changes. If this view is accepted, it raises two points of practical importance: First, it provides an additional argument for treatment and cure, when possible, of chronic sinus infections; and, secondly, the pre-existing suppuration tends to obscure the diagnosis of malignancy in its early stages.

**OPERATIVE TREATMENT.**—Certain general principles as to the prevention or repair of deformities resulting from the operative treatment of new growths of the nasal sinuses have been defined by E. M. Woodman.<sup>9</sup> To avoid unsightly

swelling below the eyelid, the old transverse incision should be given up, and he suggests, as an alternative, one commencing in the eyebrow and extending down the side of the nose. Post-operative displacement of the eyeball must be guarded against. If the infra-orbital margin of bone cannot be retained, the suspensory ligament of the eye should be left, and, in the worst cases, the eye should be supported from below by packing and a dental plate during healing. Perforation of the hard palate should be regarded as desirable and not as a deformity. Such perforation enables the operation area to be kept under observation, and the opening can be closed by a denture bearing two soft rubber extensions into the opening. Repair of the nose and face is accomplished by the use of flaps, tube-grafts, and cartilage implants. The assistance of a skilled dental surgeon is most important, and in cases in which much of the palate is removed, a temporary plate should be fitted within a few hours of operation. Such a plate serves to enable the patient to eat and swallow and also retains dressings in the cavity.

**Nasal-sinus Suppuration Complications: Cavernous Sinus Thrombosis.**—A review of this somewhat uncommon but serious complaint is given by E. R. Faulkner.<sup>10</sup> He classifies cases in accordance with the venous area from which the original infection spreads to the sinus. The four classes are: (1) Anterior foci, such as boils, etc., about the lip and eyelids; (2) Internal foci, including infection in the nasal sinuses or following intranasal operations. As far as the nasal sinuses are concerned, an acute infection on an old chronic one is usually responsible; (3) Inferior foci, embracing acute infections in the pharynx, such as a peritonsillar abscess, and dental infections; (4) Posteriorly, by an extension from the middle ear to lateral and petrosal sinuses. The symptoms vary somewhat with the site of the primary focus of infection, as does the course of the disease. Cases resulting from a nasal infection tend to show orbital symptoms similar to those produced by orbital cellulitis. Treatment will vary with the site of the original infection. Broadly, the more acute the primary focus, the less should be the operative trauma. Only the minimum should be done to provide for evacuation of any purulent collection. While the majority of the cases end fatally, a few undoubted recoveries have been recorded, and it is doubtful whether the number of such recoveries would be increased by attempts at direct operative interference with the affected cavernous sinus.

**Fracture involving the Nasal Sinuses.**—A large proportion of fractures of the facial skeleton involve one or more of the nasal sinuses. The sinus involved fills with blood, which readily becomes infected. Treatment must be based on replacement of the bony fragments to avoid deformity, and drainage of the sinus to avoid infection. J. J. Shea,<sup>11</sup> in a practical article, states that the maxillary antra are the sinuses most commonly involved, owing to the size and prominence of the upper jaws. In such a fracture, as a rule, the malar bone and the firm bone forming the malar process of the superior maxilla are displaced in the direction of the force producing the fracture (*Fig. 70*). This displacement of the malar bone may be in a forward, backward, inward, or downward direction. In a skiagram, or on palpation, an alteration in the transverse diameter of the affected orbit will be recognized, and this is a most useful guide in determining the correct position of the parts during replacement. In some cases, by the use of special forceps designed by Gill, it is possible to grasp the bone through the skin and draw it into place. In cases of considerable displacement, the fragments must be elevated by pressure from within the antrum. The simplest method of carrying this out is to make an opening below the inferior turbinal and then exert pressure with a No. 7 Ritter sound or other similar instrument (*Fig. 71*). By this means the fragments can be forced

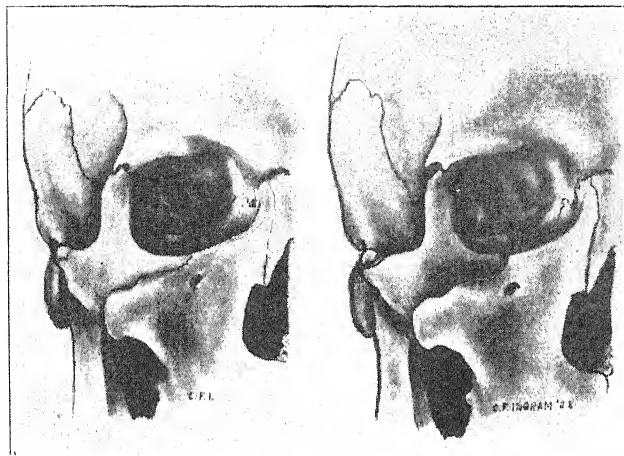


Fig. 70.—Usual displacement of malar bone as the result of a crushing injury.

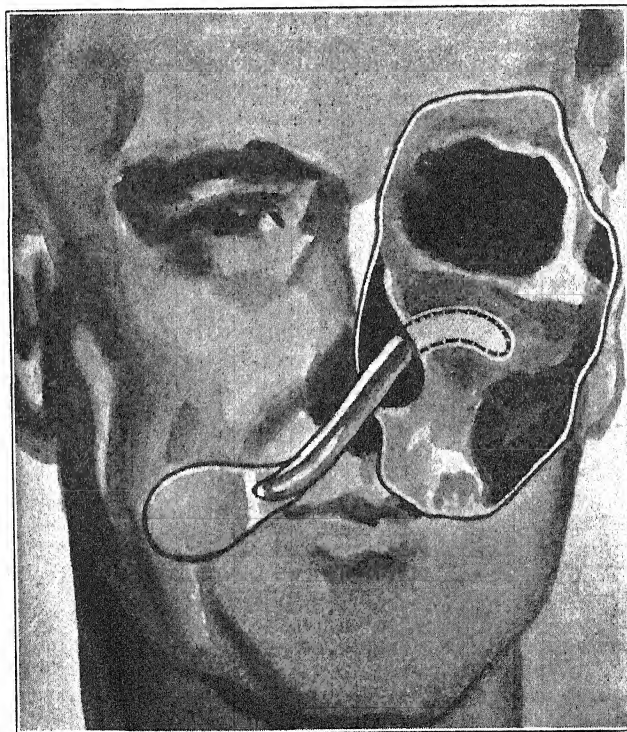


Fig. 71.—Manner of insertion of Ritter sound when elevating antral walls.  
(Figs. 70 and 71 by kind permission of the 'Journal of the American Medical Association'.)

outwards under control of the hand placed externally, and the antral opening will subsequently serve for drainage. In cases of considerable comminution, a buccal opening through the canine fossa is preferable, and in the replacement of fragments it may be necessary to divide muscular attachments. Subsequent packing should be avoided.

A force directed horizontally against the upper jaw may produce a transverse fracture of one or both upper jaws, such a fracture presenting a characteristic deformity, the upper teeth dropping down on to the lower jaw and producing an elongation of the features. These cases demand immediate reduction, care being taken to obtain good apposition of the teeth. Immobilization should be made to a solid base, and for this purpose it is sometimes convenient to encase the skull-cap in plaster, anchoring the supports from the maxilla on to this.

Fractures into the frontal sinuses may involve the anterior wall alone or the posterior wall in addition. If the posterior wall is not involved, after cleaning the wound and removing any loose fragments, drainage should be provided both through the external wound and into the nose. When the posterior or cranial wall is injured, the wound should be freely opened up, depressed bone elevated, and, if necessary, a portion removed to exclude or repair injury to the dura. It is important to prevent the sinus mucous membrane from invaginating into the fracture, as there is thereby produced a potential fissure through which future infections may enter the cranial cavity. Fractures into the ethmoidal or sphenoidal sinuses should be treated on general principles to ensure drainage.

**Frontal Sinusitis.**—Any honest observer will agree that the operative treatment of frontal sinus suppuration does not give uniformly satisfactory results. Any new method, therefore, is worthy of careful consideration. D. Harmer and B. Russell<sup>12</sup> have employed a method of intubation of the naso-frontal duct on sixty-three cases over a period of ten years. The method seems to be new in that continuous and progressive dilatation without damage to the

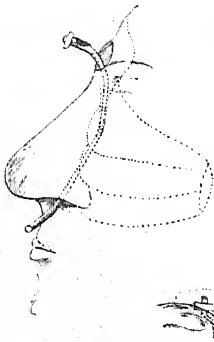


Fig. 72.—Diagram showing tube in position (first stage).

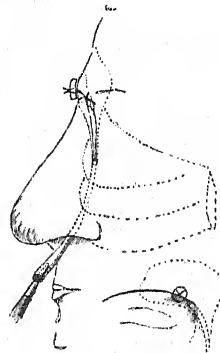


Fig. 73.—Diagram showing tube in position (second stage).

(Figs. 72 and 73 by kind permission of the 'Journal of Laryngology and Otology'.)

mucous membrane is aimed at. The method employed is as follows: After a preliminary packing of the nose with cocaine and adrenalin, the sinus is opened through a  $\frac{3}{8}$ -in. incision made immediately below the inner end of the eyebrow. Care should be taken not to injure the supra-orbital nerve, as subsequent neuralgia or discomfort may result. The opening into the sinus is made above the supra-orbital ridge with chisel and mallet, and it should be of such a size

as to admit the tip of the little finger. The centre of the opening should be  $\frac{3}{8}$  in. from the middle line. The mucosa is incised and secretion removed by suction. A thin probe is then passed down from above into the nose, its lower end being seized and dragged out. The most suitable form of probe is the flexible gold wire from a spectacle frame, and passage of the probe is made more easy if the anterior end of the middle turbinal is removed and the anterior ethmoidal cell opened intranasally. Care should be taken not to traumatize the mucosa of the infundibulum. A piece of thread is tied to the probe and pulled up and out of the wound, and by means of the thread a soft rubber catheter is then pulled into position projecting from the wound above and out of the nostril below. Such a size of catheter should be employed as will pass easily. The wound is left unsutured, and the upper end of the catheter prevented from slipping into the sinus by a small piece of rubber fixed to it transversely. In chronic cases the tube must be worn over many weeks, being replaced at intervals by a larger size as it becomes loose in the canal. After an interval of a week or two the upper end of the tube can be allowed to fall into the sinus, its end being anchored to the forehead by strings passing through the wound and tied to a small rubber button (*Figs. 72, 73*). In some cases daily irrigations are carried out, in others this is not necessary. The authors state that there has been no fatal result directly attributable to the operation, and they have found it so satisfactory that it has become the routine treatment of St. Bartholomew's Hospital for all forms of frontal sinusitis which cannot be cured by intranasal treatment.

REFERENCES.—<sup>1</sup>*Jour. Laryngol. and Otol.* 1930, Dec., 841; <sup>2</sup>*Arch. of Oto-laryngol.* 1930, xii, 561; <sup>3</sup>*Canad. Med. Assoc. Jour.* 1930, Sept., 386; <sup>4</sup>*Ibid.*, Oct., 512; <sup>5</sup>*Arch. of Oto-laryngol.* 1930, June, No. 6; <sup>6</sup>*Arch. f. Ohren-, Nasen- u. Kehlkopfsh.* 1930, cxxvi, 251; <sup>7</sup>*Jour. Amer. Med. Assoc.* 1930, June 14, 1889; <sup>8</sup>*Jour. Laryngol. and Otol.* 1930, Aug., 345; <sup>9</sup>*Proc. Roy. Soc. Med.* 1931, Feb., 435; <sup>10</sup>*Surg. Gynecol. and Obst.*, 1931, Feb., 474; <sup>11</sup>*Jour. Amer. Med. Assoc.* 1931, Feb., 7; <sup>12</sup>*Jour. of Laryngol.* 1931, June, 384.

**NAUSEA, POST-OPERATIVE.** (*See* POST-OPERATIVE COMPLICATIONS.)

**NEPHRITIS.** (*See* RENAL DISEASE.)

## NERVOUS PATIENTS AND SEA VOYAGES.

*Henry Devine, M.D., F.R.C.P.*

F. G. Macdonald<sup>1</sup> observes that there is an idea prevalent among the laity, and even to some extent among medical practitioners, that any individual suffering from nervous debility, or from any of those states which are vaguely labelled 'neurasthenia', must derive nothing but benefit from a sea voyage. While this idea is to a large extent true, there are many nervous patients who are advised to take a sea voyage for whom such treatment proves to be a failure or even disastrous. The writer suggests that the following points should be considered before a voyage is advised:—

1. **The Nature of the Case.**—The most suitable subject is the business or professional man who is suffering from physical and mental exhaustion, the result of prolonged strain or worry, so that he feels that he can no longer respond to the demands made upon him. The presence of any of the following tendencies must, however, serve to modify this statement considerably:—

a. *Insomnia.*—This condition will, in the majority of instances, be aggravated by the motion and vibration of the vessel, the washing down of the decks before dawn, and the innumerable small noises, which leave the normal sleeper undisturbed, but become sheer torment to the victim of insomnia.

b. *Depression.*—When this is a conspicuous feature, a voyage should be chosen in which intervals between ports are short, as the element of melancholy

becomes intensified when there is no prospect of land to look at for many days. Suicide is not uncommon in the very moody or melancholic type.

*c. Irritability.*—An irritable subject, whose sense of proportion is in abeyance, is very intolerant of the petty annoyances which are present from time to time on every ship. He is continually criticizing and making complaints on all sorts of grounds, mostly trivial; and in a small ship he may succeed in ruining the general atmosphere of mutual goodwill and happiness.

*d. Alcoholism.*—This is an absolute contra-indication, whether it be the cause or the result of the patient's illness.

*e. Liability to Sea-sickness.*—In the writer's opinion those who are liable to succumb to the motion of a vessel should not select a sea voyage as a form of convalescence. The exhaustion and acidosis which may be caused by a prolonged period of sea-sickness impose a great strain upon a nervous system already debilitated and lacking in recuperative powers.

**2. The Economic Factor.**—This consideration is mentioned because it is essential for the patient to be in a position to afford the expense of obtaining a cabin of the higher grades.

**3. Companionship.**—A neurasthenic patient should be accompanied by someone to provide the moral support and encouragement which is so often needed to overcome, gradually and tactfully, the usual disinclination to associate with others and to join in the life of the ship, and to watch for any signs of relapse.

**4. The Nature of the Voyage.**—The voyage selected should be one in which the minimum of rough weather may be expected, and in which there is no danger of excessive heat.

In conclusion, the writer suggests that a letter to the ship's surgeon often obviates many difficulties.

REFERENCE.—<sup>1</sup>*Practitioner*, 1930, Aug., 340.

**NEURALGIA, TRIGEMINAL.** (*See also* DENTAL PAIN: TOOTHACHE.)

**NEURASTHENIA.** (*See* PSYCHONEUROSES.)

**NEURITIS, ANTERIOR CRURAL.** *Macdonald Critchley, M.D., F.R.C.P.*

Inflammatory lesions of acute or subacute onset are not commonly encountered in the territory of the anterior crural nerve. It is probable, however, that the condition is one which often escapes recognition, being regarded superficially as one of the neuralgias of the lower extremity, or even as sciatica.

Arising from the 2nd, 3rd, and 4th lumbar roots, in their dorsal portions, the anterior crural nerve passes under Poupart's ligament, on the outer side of the femoral vessels. It supplies all the muscles on the front of the thigh, except the tensor fasciæ femoris; its sensory territory as supplied by the internal and middle cutaneous, and the long saphenous branches, includes the front and inner aspect of the thigh and also the inner side of the leg as far as the ankle. Articular twigs are given off to the knee-joint.

**SYMPTOMS AND SIGNS.**—Symptoms of anterior crural neuritis comprise pain and dysæsthesiæ in the leg. The former is severe in character, and aggravated by straining, coughing and sneezing, and especially by movements of the limb. The pain is referred to the front of the thigh, to the region of the groin, and even into the iliac fossa; when the neuritis involves the radicular portions of the anterior crural nerve, pain may also be referred along the external cutaneous nerve—that is, down the outer side of the thigh.

Movement is greatly hampered by reason of the pain, and it is often possible to demonstrate a particular impairment of extension of the knee. As a result

the knee may give way and the patient trip over small objects. Walking is difficult, especially up and down stairs; when ascending he mounts step by step, leading off each time with the sound leg; when descending he commences with the affected limb.

Examination reveals a characteristic attitude; the patient lies in bed with the affected leg extended and with the weight of the body a little on the affected hip. Passive manipulations evoke pain when the nerve is stretched; this is produced by adduction and abduction of the thigh, and particularly by hyperextension at the hip-joint, as carried out by bending the thigh back when the patient lies on his face. Lasègue's sign, so characteristic of sciatica, is absent—that is, extension of the knee when the hip is flexed is not particularly painful. There is no tenderness on pressure over the surface markings of the sciatic nerve, the sites of maximum pain being the groin and the outer side of the thigh, immediately below the great trochanter.

Some flabbiness and wasting may be demonstrable in the quadriceps extensor muscles; fibrillation is rare. The knee-jerk is sluggish or may be lost; the ankle-jerk is normal. Objective sensory impairment may be found at times in the front and inner aspect of the thigh, and sometimes on the outer side also.

DIAGNOSIS.—The main points of differentiation between sciatica and anterior crural neuritis may be tabulated as follows :—

	SCIATICA	ANT. CRURAL NEURITIS
Site of pain .. ..	Buttock, Back of thigh, and calf	Front of thigh, inner and outer side of thigh, inner side of leg at times
Attitude when supine ..	Lies on opposite buttock. Hip and knee slightly bent	Lies on buttock of same side. Leg extended
Weakness of movement ..	Most marked in dorsiflexion of ankle	Especially in extension of knee
Flaccidity and wasting ..	Most marked in calf	Quadriceps extensor
Reflexes .. ..	Knee-jerks ++ Ankle-jerks $\pm$ or 0	Knee-jerks + or 0 Ankle-jerks +
Passive movements ..	Pain on extending knee or flexing hip	Pain on abducting, adducting or hyper-extending hip
Painful points on pressure	Gluteal fossa; along the back of lower extremity from the emergence of great sacro-sciatic notch to the tendo Achillis	Groin, outer side of thigh immediately below great trochanter
Objective sensory impairment	If present, dorsum of foot, and sole and skin overlying tendo Achillis	Front of thigh, outer and inner aspect of thigh

ETIOLOGY.—The two chief causes of anterior crural neuritis are subacute non-articular rheumatism and diabetes. It may also follow infectious diseases such as influenza, and Wilfred Harris<sup>1</sup> describes a case following a severe burn on the palm of the hand. One must be careful to exclude, however, damage to the nerve or to its roots, such as may result from the pressure of pelvic growths; psoas abscess; very occasionally the anterior crural nerve has been injured during parturition and also from dislocation of the hip.

REFERENCE.—<sup>1</sup>*Neuritis and Neuralgia*, 1926, 114, London.

## NEURITIS OF THE HAND, OCCUPATIONAL.

*Macdonald Critchley, M.D., F.R.C.P.*

As the result of long-continued trauma entailed in the performance of various occupational activities, atrophy of the small muscles of the hand may develop. The absence of objective sensory changes raises the diagnosis of progressive muscular atrophy in such cases. In a series of papers, Ramsay Hunt<sup>1-5</sup> has

given minute descriptions of this particular disorder and has isolated certain distinctive groups. Recent papers by Wilfred Harris<sup>6</sup> and a note by C. Worster-Drought<sup>7</sup> have directed attention to these craft palsies. Following Hunt's examples, we may subdivide the cases of occupational neuritis of the hand into: (1) A median or thenar type; (2) An ulnar or hypothenar type; and (3) Gessler's atrophy of the hand.

1. In the *median or thenar type*, wasting gradually shows itself in the muscles of the outer side of the ball of the thumb—namely, the superficial head of the flexor brevis pollicis, the abductor and the opponens pollicis. Electrical tests reveal the reaction of degeneration in the affected muscles. No objective sensory loss is demonstrable, though the patient may complain of tingling, numbness, or pins and needles in the region of the thumb.

The type of occupation which tends to produce such an affection is one where repeated or prolonged pressure is made upon the palm of the hand, especially in the neighbourhood of the anterior annular ligament. Hence,

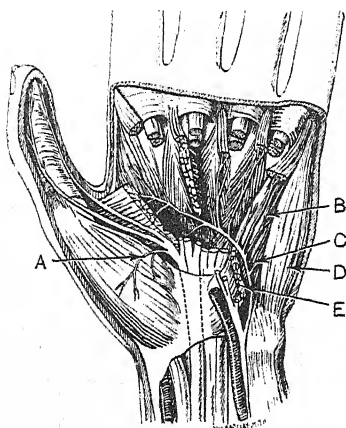


Fig. 74.—Dissection of palm of hand to demonstrate the recurrent branch of the median nerve (A), and the deep volar branch of the ulnar (C). B, Opponens minimi digiti; D, Abductor minimi digiti; E, Flexor brevis minimi digiti.

this thenar type of neural atrophy may arise in floor-scrubbers or in gardeners—from the pressure of the handle of a spade or trowel. The causation of the wasting must be attributed to pressure upon the recurrent branch of the median nerve as it hooks back over the distal border of the unyielding anterior annular ligament of the wrist, to be distributed to the muscles on the outer side of the thumb (Fig. 74). As this twig of the median nerve contains motor fibres alone, the absence of sensory impairment is explicable.

Harris has also noticed numbness and partial anaesthesia of the middle three fingers as the result of prolonged pressure on the palm of the hand. Here of course, the trauma operates upon the median nerve in the depths of the palmar space.

2. The *ulnar or hypothenar variety* of wasting consists in weakness of abduction and adduction of the three outer fingers and also of adduction of the

thumb. Difficulty is experienced in writing and in picking up small objects. There is no wasting of the thenar or hypothenar eminences, and no paresis of abduction or opposition of thumb and little fingers. Neither is weakness demonstrable in the palmaris brevis. Sensory loss does not occur. In such cases there is clearly an affection of the deep palmar (or volar) branch of the ulnar nerve, which contains motor fibres only: the twig to the palmaris brevis issues from the superficial portion of the ulnar nerve and therefore escapes. The exact manner in which this deep branch is injured is debatable; in most of the cases recorded the occupation has been such as to entail forcible flexion of the fingers, particularly at the metacarpo-phalangeal joints. Thus it has been noted several times in motor-cyclists, who have been accustomed to gripping the handle-bars too tightly. It has been recorded in cobblers, from excessive use of the shoemaker's knife; in jewellers; machinists; and in oyster-openers whose work entailed the opening of four to five thousand oysters daily. Three possible ways of injury of the deep palmar branch may



be cited: first, the nerve may be compressed as it crosses the metacarpal bones just below their bands; secondly, it may be damaged by traction from its relationship to the hook of the unciform; the third and most probable explanation is that excessive and prolonged flexion of the phalanges causes an undue contraction of the abductor and of the short flexor muscles of the little finger, between the tendinous origin of which the deep palmar branch passes (*Fig. 74*).

3. *Gessler's type* of occupational atrophy was described in gold polishers,<sup>8</sup> and consists in a wasting of both median and ulnar groups of hand muscles, together with cyanosis. No sensory changes occur. Gessler believed that frequent contractions of the hand muscles lead to a relative ischemia of the tissues with subsequent damage to the nerve-endings. The status of this type of atrophy has never been satisfactorily established, and it is doubtful whether any cases have been described since Gessler's original publications thirty-six years ago. Ramsay Hunt, indeed, wonders whether Gessler's cases do not belong to the ulnar or hypothenar group of occupational atrophies.

REFERENCES.—<sup>1</sup>*Jour. Nerv. and Ment. Dis.* 1908, xxxv, 673; <sup>2</sup>*Trans. Amer. Neurol. Assoc.* 1909, xxxv, 1184; <sup>3</sup>*Amer. Jour. Med. Sci.* 1911, cxli, 224; <sup>4</sup>*Rev. Neurol. and Psychiat.* 1914, April, 137; <sup>5</sup>*Brit. Med. Jour.* 1930, ii, 642; <sup>6</sup>*Ibid.* 1929, i, 98; <sup>7</sup>*Ibid.* i, 247; <sup>8</sup>*Med. Corresp.-Blatt des Württemberg. ärztl. Landes Vereins.* 1896, lxvi, 281.

### NEURITIS, HYPERTROPHIC INTERSTITIAL (Dejerine-Sottas Disease).

Macdonald Critchley, M.D., F.R.C.P.

Recent clinical studies of this affection suggest that its rarity has perhaps been overstressed hitherto and, moreover, that the clinical symptomatology differs in many particulars from the picture originally described. Evidence is accumulating which seems to indicate a close association with other neurological disorders and in particular with peroneal muscular atrophy.

Originally described in 1899 by Gombault and Mallet<sup>1</sup>, this condition was at first regarded as comprising a familial nervous affection of children, characterized by wasting and sensory impairment of the extremities, alterations in the reflexes, and in particular by a uniform and palpable enlargement of the peripheral nerves. Additional symptoms of varied type appeared in cases subsequently recorded, but we now believe that such features as nystagmus, pupillary signs, and numerous other anomalies are inconstant and non-essential. The most important diagnostic criteria comprise muscular atrophy and enlargement of the nerves. We know, furthermore, that the disease may be non-familial and actually develops most often in the adult.

A series of papers published during the last three years suggests that the disease may often be overlooked unless careful search is made for enlargement of the peripheral nerves during routine neurological examination. The papers of W. D. Newcomb,<sup>2</sup> W. Harris, R. S. de Bruyn, and R. O. Stern,<sup>3</sup> W. R. Russell and H. G. Garland,<sup>4</sup> and W. G. Sears,<sup>5</sup> add much to the modern clinical and pathological conceptions.

CLINICAL CHARACTERISTICS.—Following Sears' review of the symptomatology we may depict the common features thus: usually the onset dates from childhood with the development of pes cavus; after an interval of some years the arms and legs become atrophic. A positive family history occurs in most instances where the symptoms arise in childhood; adult cases are often not hereditary. The characteristic signs comprise atrophy of the distal segments of the limbs with the presence of such deformities as claw-hand, claw-foot, and scoliosis. Reflexes are either sluggish or unobtainable; the plantar responses vary; they are usually absent, but very occasionally a Babinski response is seen. Sensory loss may be present over arms and legs; pains in the limbs are not uncommon; vasomotor changes have been described.

In three cases described by the earlier writers, sluggish or absent pupillary reflexes to light were mentioned, but this finding seems to be rare from subsequent experience. The possibility of a coincident syphilis in the original patients is very great.

The most characteristic sign is enlargement of the peripheral nerves; those most often affected are the internal cutaneous of the forearm, the ulnar, the saphenous, and the superficial cervical nerves (*Plate XLIV*). At times the hypertrophy is such as to render the nerves visible to the naked eye; in other cases the hypertrophy may be inconspicuous and revealed only at autopsy.

**PATHOLOGY.**—According to de Bruyn and Stern, the main histological characteristics comprise an hypertrophy of the interstitial and neural elements in the peripheral nerves and spinal ganglia. Myelin may be absent from the distal parts of the nerve. The important finding is that of masses of tissue, with or without nuclei, arising from the sheath of Schwann; they may be laminated, when they are spoken of as 'onion-bulbs'. Associated changes are sometimes found in the anterior horn cells as well as in the posterior columns of the spinal cord.

**COURSE AND PROGNOSIS.**—The disease appears to constitute no menace to life, and the progression is extremely slow. When the symptoms commence later in life, however, the advance may be more rapid. No treatment is known, but orthopaedic measures are often indicated to relieve deformities.

**REFERENCES.**—<sup>1</sup>*Arch. de Méd. exper.* 1889, 1, 385; <sup>2</sup>*Brain*, 1929, lli, 108; <sup>3</sup>*Ibid.* 84; <sup>4</sup>*Ibid.* 1930, liii, 376; <sup>5</sup>*Jour. Neurol. and Psychopathol.* 1931, xii, 137.

**NEUROSES.** (*See PSYCHONEUROSES.*)

**NEUROSYPHILIS.** (*See SYPHILIS.*)

**NOSE, DISEASES OF.** (*See also ASTHMA; NASAL SINUSES.*)

*A. J. M. Wright, M.B., F.R.C.S.*

**Intranasal Operations for Asthma in Children.**—Opinions differ as to the value of nasal operations in the treatment of asthma. Sir J. Dundas Grant<sup>1</sup> has drawn attention to the benefit which he has obtained in the asthma of childhood by intranasal operations, particularly the removal of the middle turbinals. He gives brief histories of eighteen cases and claims in only one of these was there not very considerable improvement as a result of the operation, such improvement being, in most cases, persistent. He only suggests that such an operation should be carried out in cases in which obstruction is present and in which the middle turbinal is enlarged. The operation is performed under a general anaesthetic, and to obtain adequate access to the turbinal, which is not always easy in a child, he employs forcible dilatation with a long Killian speculum. The ages of the children were from 3½ to 14 years. If one accepts the view that operations for the relief of nasal obstruction may be sometimes helpful in the treatment of asthma, it seems reasonable to suppose that the earlier in the history of a case such operations may be carried out, the more likely are they to prove successful.

**Treatment of Asthma, Vasomotor Rhinitis, and Hay Fever, by Carbon Dioxide.**—As a result of his personal experience of the treatment of vasomotor rhinitis by the inhalation of the natural gas from Mont Dore waters, which consist of 99 per cent carbon dioxide, A. F. Hurst<sup>2</sup> has been encouraged to try the effect of a douche of ordinary CO<sub>2</sub>. The douche is given from a small cylinder of compressed gas furnished with a rubber tube and nose-piece. The rate of flow is first checked by immersing the nose-piece in a glass of water and it is then inserted into one nostril of the patient and the gas is allowed to flow. The patient should breathe through his mouth and the gas should not

# PLATE XLIV

## HYPERTROPHIC INTERSTITIAL NEURITIS



Fig. A.

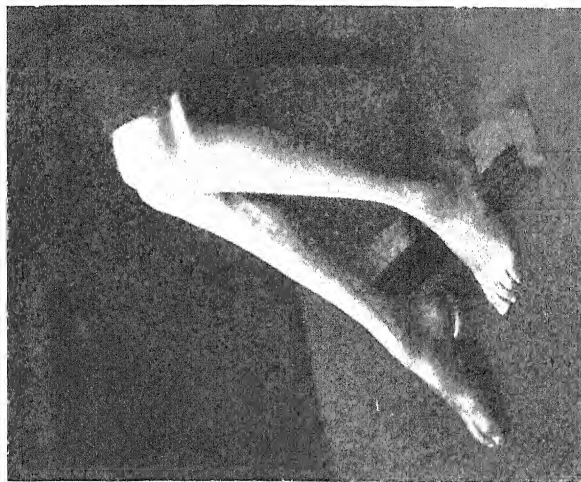


Fig. B.



Fig. C.

Fig. A.—Right upper extremity of a patient with hypertrophic interstitial neuritis, illustrating the visible enlargement of the internal cutaneous nerve.  
Fig. B.—Lower extremities of same patient.

Fig. C.—Piece of excised internal cutaneous nerve from the left arm of same patient showing the distinct hypertrophy.



be actually inhaled. In cases of vasomotor rhinitis the treatment should be given for from five to ten minutes up each nostril every morning. In hay fever this should be done throughout the season and, in addition, immediately an attack threatens to begin. In cases of asthma which commence with an attack of sneezing and nose-running, the gas may prevent the attack from developing. The author gives no suggestion as to its method of action, but considers that it is due to some direct effect on the nasal mucous membrane.

REFERENCES.—<sup>1</sup>*Lancet*, 1931, i, 468; <sup>2</sup>*Jour. Laryngol. and Otol.* 1931, June, 413.

## NYSTAGMUS.

W. S. Duke-Elder, M.D., F.R.C.S.

*Miners' nystagmus* is a relatively common disease which is of considerable importance, not only from the disability which it causes the sufferer, but from the considerable economic loss which it involves to the mining industry. A very extensive investigation into the subject has recently been made by W. J. Roche,<sup>1</sup> wherein he examined 212 cases in South Wales in the consulting-room, in a dark room, at the pit-head, and in the mine underground. He recognizes four stages in the development of nystagmus: (1) latent, (2) subacute, (3) acute, and (4) the neurasthenic stage. The latent type of nystagmus is noted only immediately after the working shift; in it the oscillations of the eyes are temporary and can be elicited only when the patient is made giddy. In the subacute type while the man is at work or placed in an awkward position he is affected by headache, which may be either frontal or occipital, and a sense of dazzling to light; at the same time a deficiency of vision in the twilight and a temporary giddiness may be complained of, lasting for a few hours after the day's work has ceased. In addition to an oscillatory nystagmus of the eyes, photophobia is a common symptom, while giddiness on bending down and a lowering of the visual acuity, with a characteristic slowness in picking out the letters of the test types, are also symptomatic. In the acute type all these symptoms become aggravated. The oscillations of the eyeball are always present and may be relatively slow (100 to the minute) or may be fast (from 200 to 350 per minute); they are pendulum-like in nature, the side-to-side movement being equally rapid in both directions. Meantime the photophobia becomes associated with a spasm of the lid or of the levator muscle, and vertigo becomes the most incapacitating symptom. In the final stage, neurasthenic symptoms are added to the other signs of the disease.

It is generally agreed that the principal cause of miners' nystagmus is defective illumination, but Roche draws attention to the curious anomaly that since the illumination in mines generally has been improved by the introduction of electric lamps, the disease has increased considerably. He thinks, however, that the men who have become incapacitated are those who have suffered from latent nystagmus while using oil lamps and that with the change over to the electric lamps the irritation of the brighter light aggravated the disease. He concludes that the ideal lamp is one attached to the cap, and that in all cases the lamp should not be more than 4-candle-power and that they should be frosted; moreover, on going to and returning from work an opaque shade should be attached to the pillars on the back of the lamp in order to avoid glare. He brings forward convincing reasons that while the primary cause of the nystagmus is deficient illumination, an important secondary cause is malposition at work, and that the essential feature of the disease is non-organic whereby co-ordinate movements of the body, and particularly of the eyes, have become inco-ordinate owing to the altered afferent impulses received from the eyes and the labyrinths and the consequent alteration in the reflex efferent impulses transmitted to the muscles.

He recommends that men with nystagmus in all cases would be well advised

to change their occupation, if this is possible, for in many of the cases a definite neurasthenic element is present; these could well do light employment in which they would gradually regain their confidence. If a return to work after an attack of nystagmus is necessary, they ought not to be given collier's work at the beginning, but should be employed above ground. From his statistical study the author is justified in his conclusion that the sons of men who have had nystagmus should not be employed underground.

REFERENCE.—<sup>1</sup>*Brit. Jour. Ophthalmol.* 1931, xv, 211.

## OBESITY.

W. Langdon Brown, M.D., F.R.C.P.

It might well have been hoped that the introduction of biochemical tests, such as the estimation of the basal metabolic rate and the sugar tolerance curve, would have thrown much light on the etiology of obesity. The careful metabolic observations of Gardiner Hill and his co-workers a few years ago showed that this hope was not yet fulfilled. Since then the most promising work has been in connection with hyperinsulinæmia (see HYPERINSULINISM AND HYPOGLYCÆMIA). E. P. Poulton, in his Presidential Address to the Therapeutical Section of the Royal Society of Medicine, expressed his belief that there is a good deal to be said for this theory of obesity, and that the frequent occurrence of diabetes in obesity is compatible with the wearing out of an over-active functional process, just as hyperthyroidism is commonly followed by hypothyroidism. If too much carbohydrate is taken, the production of insulin may be stimulated, with consequent increase of appetite, and a vicious circle is established. It is curious that D. Columba<sup>1</sup> comes to the conclusion that in obesity there is hypo-insulinæmia, which is opposed to the general view.

H. H. Fellows<sup>2</sup> finds that the incidence of diabetes among the parents of overweight individuals is twice that of the insured population over 45 years of age, while the influence of heredity is clearly shown by the fact that both the parents of such individuals were overweight in 24 per cent of the cases. In connection with the association between overweight and parental diabetes, the occurrence of hyperinsulinæmia in children born of a diabetic mother is of interest (see HYPERINSULINISM AND HYPOGLYCÆMIA). All this work tends to bring overweight more closely into relationship with disturbed carbohydrate metabolism. Like others, Fellows finds that while it is a relatively easy matter to reduce overweight, it is much more difficult to maintain weight at a reduced level.

In a study of the problems of obesity, D. Murray Lyon<sup>3</sup> found a standard diet of 1000 calories, containing C. 100 gm., P. 60 gm., F. 40 gm., the most convenient to work with. The diet could be made bulky by giving the carbohydrates largely in the form of vegetables and fruit. He gave **Thyroid Extract**, but pointed out that its action is not single or simple. It quickens the whole of metabolism, raising the metabolic rate, at the same time increasing the breakdown of tissue protein. It also dehydrates the tissues (though this effect comes to an end in seven to ten days).

S. Silver and J. Bauer<sup>4</sup> doubt the suggestion, originally made by Falta, of hyperinsulinism as an explanation of obesity—because in the cases of hyperinsulinism with hypoglycæmia the patients did not become obese though given large amounts of carbohydrates to combat the hypoglycæmia. They do not think that endocrine dysfunction accounts for more than 3 per cent of the cases, and quote with approval von Bergmann's comparison of the factors resulting in growth with those resulting in obesity. Just as a youth grows, although his activities make great demands on his caloric intake, so some tissues accumulate fat, often at the expense of the needs of other organs. That there is an independent, local, predestined tissue disposition to obesity is

proved by the results of an autogenous tissue transplant from the abdominal wall to the back of the hand, when a distinct, local, unilateral obesity occurred in a site which rarely becomes fat normally. The authors consider that the transplanted tissue, separated from its previous nerve- and blood-supply, retained its *lipophilia*, i.e., its irresistible tendency to accumulate fat. Though it is useful to emphasize the constitutional factor and to deprecate facile references to unproved endocrine factors, surely to explain obesity by a lipophilic tendency of the tissues, is like a classical explanation of the hypnotic action of opium as being due to its 'dormitive principle'.

REFERENCES.—<sup>1</sup>*Polidlinico*, 1931, Feb. 16, 219; <sup>2</sup>*Amer. Jour. Med. Sci.* 1931, March, 301; <sup>3</sup>*Edin. Med. Jour.* 1931, May, 73; <sup>4</sup>*Amer. Jour. Med. Sci.* 1931, June, 769.

**OBSTETRIC SHOCK.** (See LABOUR AND ITS COMPLICATIONS.)

**ODONTALGIA.** (See DENTAL PAIN: TOOTHACHE.)

**ÆSOPHAGUS, DISEASES OF.** (See also CARDIOSPASM.)

A. J. M. Wright, M.B., F.R.C.S.

**Carcinoma.**—The results of any form of treatment have been so unsatisfactory up to the present that it would seem justifiable to attempt any new method however unorthodox. Under this heading might be described a case in which A. Seiffert<sup>1</sup> successfully removed a carcinoma situated in the œsophagus at the level of the manubrium sterni through the œsophagoscope. After injection with novocain into the peri-œsophageal tissues through the œsophagoscope, a circular incision was made above the tumour with scissors and the growth separated from the surrounding tissues. The tumour was then removed in fragments down to normal œsophageal tissue and a rubber tube inserted through the nose and œsophagus into the stomach. The tube was removed four days later, and fourteen months after the operation the condition of the patient was satisfactory and he swallowed solid food normally.

The technique of the resection of œsophageal carcinoma by the trans-pleural route is being further elaborated by C. Eggers.<sup>2</sup> The operation he advocates is a modification of that originally devised by Torek, the removal being partly carried out through a thoracic incision and partly through one along the anterior border of the left sternomastoid. The operation itself is not unduly difficult, but the bad general condition of the patients, combined with the fact that they are usually senile, renders them poor subjects for any severe operative measures. Two or three weeks should be spent in improving their condition before operation, among measures employed for this purpose being the performance of a **Gastrostomy**.

**Radium Treatment.**—The very great majority of observers have reported unfavourable results from the radium treatment of œsophageal carcinoma. J. Guisez<sup>3</sup> stands perhaps alone in being able to report no fewer than 24 successful results; 14 are still well after four or five years. He states that radium treatment is only efficacious when the growth has not passed the limits of the œsophageal wall, and he therefore regards glandular enlargement and paralysis of the recurrent laryngeal nerves as contra-indications. The most favourable cases for radium therapy are those in which the growth involves the middle third of the œsophagus. After a preliminary dilatation of the stricture through the œsophagoscope, applications of radium for five or six hours each day, for at least fifteen days are given. The radium is screened with  $1\frac{1}{2}$  mm. of platinum and is applied in a container at the end of a non-metallic sound. Care must be taken to employ sufficient length of radium to irradiate the whole extent of the tumour. Even in the less successful cases it is stated that the patient once more becomes able to take solid food.

**Benign Cicatricial Stricture.**—A report based on forty cases of cicatricial stenosis of the œsophagus of unknown origin is given by P. P. Vinson.<sup>4</sup> The onset of dysphagia in these cases is usually insidious. The ages ranged from 6 to 75 years and the duration of symptoms from six weeks to many years. Dysphagia was present to some degree in all cases and pain in more than half, being sometimes confined to the act of swallowing. Regurgitation was frequent. X-ray examination taken alone would have led to a diagnosis of malignancy in some of the cases, but examination with the œsophagoscope showed the appearances of a benign stricture. A combination of a rather long history of dysphagia without marked progression in a case in which the patient is fairly well nourished should suggest that the lesion is benign. The smooth outline of the stricture on X-ray examination, combined with the benign appearances through the œsophagoscope, should be considered to confirm this. **Dilatation** is advised in all instances, and in cases of doubt this should establish the diagnosis, the absence of progression in the disease after dilatation negating malignancy. The method of dilatation by passing a bougie over a swallowed silk thread was employed.

An unusual cause of cicatricial œsophageal stenosis is reported by W. Stupka.<sup>5</sup> In his case a stenosis in the thoracic œsophagus was apparently due to a mediastinitis following on an undiagnosed fracture of the thoracic vertebrae.

G. Tucker,<sup>6</sup> in a general review of cicatricial strictures, advises dilatation with bougies passed under direct vision through the œsophagoscope in all cases in which a gastrostomy is not necessary for feeding. In cases in which a gastrostomy is necessary, he employs retrograde dilatation. After a previously swallowed thread has been drawn out of the gastrostomy opening, special soft rubber bougies with tapered ends are pulled up through the stricture by means of the string. These bougies are made in sizes from 10 to 34 French catheter gauge and are 35 cm. in length. After the first few times, the patient, even if a child, is usually able and willing to pull the bougie up himself. In such cases as these, the gastrostomy tube should be worn for at least six months after dilatation of the stricture is complete, and the œsophagus should be inspected through the œsophagoscope before the gastrostomy wound is allowed to close.

**Unusual Œsophageal Lesions.**—From his wide experience, Chevalier Jackson<sup>7</sup> has described four allied conditions which he has observed in the œsophagus—namely, urticaria, angioneurotic œdema, serum disease, and herpes. The angioneurotic œdema occurred in a woman who was suddenly seized with abdominal pain, painless swellings of the hands, lips, eyelids, and tongue, and inability to swallow solids. Œsophageal examination showed the presence of whitish nodules with intensely red bases in the mucous membrane of the thoracic œsophagus. The symptoms gradually cleared up, but there was a history of previous attacks. The case of urticaria, also in a woman, was characterized by complete inability to swallow even fluids, and was accompanied by a characteristic eruption on chest, back, and face. Œsophagosecopy showed a firm white nodular swelling in the lower part of the œsophagus. The condition cleared up in a few days. The case of serum disease occurred in a male of 18 and was characterized by œsophageal obstruction coming on suddenly four days after the injection of diphtheritic antitoxin. The lumen of the œsophagus was seen to be completely closed by firm white nodular lesions just below its upper end, the condition clearing up spontaneously in a few days. The case of herpes occurred in a woman of 52 who had complained of intermittent attacks of difficulty in swallowing with discomfort and burning in the centre of the chest. The lower third of the œsophagus showed a chronic



inflammatory condition with some superficial ulceration. General medical treatment, combined with local application of **Bismuth**, caused the ulceration to heal rapidly. The probable diagnosis of herpes was based both on the appearances, and on the evanescent character of the lesions.

**Congenital Stenosis of the Æsophagus associated with Diaphragmatic Hernia of the Stomach.**—Since A. Brown Kelly,<sup>8</sup> during the course of a few years, has met with four cases in which a congenital stenosis low down in the æsophagus was associated with herniation of part of the stomach through the diaphragm into the thorax, he suggests that the condition cannot be very rare. He believes that these cases have not been previously recognized because, in the first place, regurgitation of food in a small child is usually regarded as vomiting and is not therefore followed by an æsophageal examination, and also unless particular care is taken at an X-ray examination, the existence of a gastric hernia is likely to be missed. Four cases related were observed at ages of from four weeks to eight years. In all of these persistent vomiting or

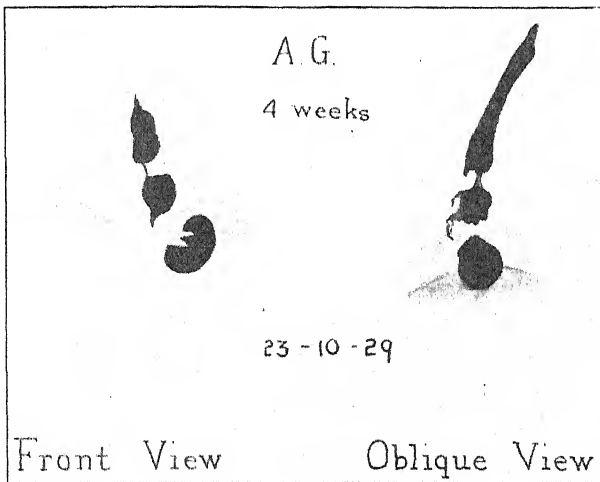


Fig. 75.—Skiagram of congenital stenosis of the æsophagus associated with diaphragmatic hernia of the stomach. (Skiagram kindly supplied by Dr. A. Brown Kelly.)

regurgitation of fluid was the outstanding symptom, and in all of them this set in either immediately after or within a few days of birth. The skiagrams of his Case 4 (Fig. 75), a boy four weeks old, were obtained after introducing barium through the æsophagoscope. The uppermost of the three sacs represents a dilatation of the æsophagus above the stenosis. The middle sac, being situated between the stenosis and the diaphragm, is probably a herniated portion of stomach, while the lower sac is the main abdominal portion of the stomach. It is suggested that both the stenosis and the herniation are congenital abnormalities, and this view is strongly supported by the fact that in Case 4, since the child was only four weeks old, it is unlikely that herniation could have been acquired. As to the mechanism of production, it is suggested that the condition may be due either to a congenitally short æsophagus, to a congenital defect, or to weakness of the muscles bounding the hiatus in the diaphragm. No suggestions are made as to treatment. [I myself have under treatment a boy of 11 in whom obstruction to swallowing had been present

from birth, and an X-ray shows a sac above the diaphragm similar to that described by Brown Kelly. This sac is present below the stenosis and was missed for two years in spite of repeated X-ray examination, owing to the fact that the stenosis held up the opaque mixture and prevented the sac from filling. This would seem to support Brown Kelly's view that the condition cannot be a great rarity. My own case is under treatment by retrograde dilatation after the method described by Tucker above.—A. J. M. W.]

REFERENCES.—<sup>1</sup>*Zeits. f. Hals-, Nasen- u. Ohrenheilk.* 1929, xxiv, 585; <sup>2</sup>*Surg. Gynecol. and Obst.* 1931, March, 739; <sup>3</sup>*Bull. et Mém. Soc. de Chir.* 1930, xxii, 751; <sup>4</sup>*Surg. Gynecol. and Obst.* 1931, May, 955; <sup>5</sup>*Zeits. f. Laryngol.* 1930, Oct., 35; <sup>6</sup>*Laryngoscope*, 1931, June, 426; <sup>7</sup>*Arch. of Oto-Laryngol.* 1930, April, No. 4; <sup>8</sup>*Jour. Laryngol. and Otol.* 1930, Oct., 680.

## OMENTUM, TORSION OF.

A. Rendle Short, M.D., F.R.C.S.

Quite a number of papers have appeared during the year on this subject (J. W. Jefferies,<sup>1</sup> D'Errico,<sup>2</sup> M. J. Smyth,<sup>3</sup> J. G. Knoflach<sup>4</sup>). It has usually been diagnosed as acute appendicitis or cholecystitis. In the differential diagnosis from appendicitis, Jefferies mentions that the pain begins in the right iliac fossa in omental torsion (in appendicitis, of course, it is usually mid-abdominal at first), the pulse and temperature are less disturbed, vomiting is infrequent, and there is a large swelling palpable from the first. About forty cases are on record. The post-operative mortality is about 5 per cent.

[Since writing the above, I have had a case which recovered after operation.—A. R. S.]

REFERENCES.—<sup>1</sup>*Ann. of Surg.* 1931, March, 761; <sup>2</sup>*New Eng. Jour. Med.* 1930, Dec., 1181; <sup>3</sup>*Lancet*, 1930, ii, 572; <sup>4</sup>*Deut. Zeits. f. Chir.* 1930, July, 436.

## OPHTHALMOPLÉGIA INTERNA WITH ABSENT TENDON-JERKS.

Macdonald Critchley, M.D., F.R.C.P.

In 1927 Gayler Morgan and C. P. Symonds<sup>1</sup> drew attention to a small group of cases in which certain abnormalities of the pupil, including irregularity and defective reaction to light and convergence, and also some affection of accommodation, were associated with an absence or diminution of the tendon-jerks. A more recent communication by the same authors<sup>2</sup> deals with a larger series of cases, and was followed shortly afterwards by W. J. Adie's paper<sup>3</sup> on "Pseudo-Argyll Robertson Pupils with Absent Tendon Reflexes; a Benign Disorder simulating Tabes Dorsalis". The age of the patients varied between 17 and 45. Early symptoms comprised an accidentally discovered irregularity of the pupils; also, at times, difficulty in focusing. At other times the condition was discovered during the course of a routine medical examination. Typical physical signs consist in dilatation and at times eccentricity of the pupil with inactivity to light. Contraction of the pupil on accommodation may also be defective or absent. Sometimes the reaction is not lost, but is characterized by an extreme slowness in contraction and dilatation (the 'myotonic pupil'). Absence of the tendon responses constitutes the other neurological abnormality. Sensory changes, subjective and objective, are absent, and no other clinical or serological evidences of syphilis are discoverable. The etiology of this disorder remains a mystery; Morgan and Symonds originally suspected that their cases constituted a *forme fruste* of epidemic encephalitis, but the absence of characteristic sequelæ and the occurrence of further cases since the subsidence of the epidemic of encephalitis, do not bear out this suggestion.

REFERENCES.—<sup>1</sup>*Guy's Hosp. Rep.* 1927, lxxvii, 13; <sup>2</sup>*Proc. Roy. Soc. Med.* (Sect. Neurol.), 1931, May, 267; <sup>3</sup>*Brit. Med. Jour.* 1931, i, 928.

**OPTIC ATROPHY.***W. S. Duke-Elder, M.D., F.R.C.S.*

Of recent years the possibility has been advanced on good authority that tabetic optic atrophy is less frequently seen nowadays, is milder, and is more responsive to antisyphilitic therapy. These suggestions have been investigated by I. John from comprehensive statistics gathered in Vienna of four typical years, the years chosen being 1905, 1910, 1920, and 1925. These years represent different phases in the changing methods of treatment in syphilis: in 1905 potassium iodide was largely depended upon; in 1910 the same treatment was used, except for the occasional introduction of mercury; in 1920 endolumbar salvarsan treatment was introduced, and some cases were inoculated with malaria; in 1925 more varied combinations were used—malaria sometimes in combination with salvarsan, suboccipital injections of air, salvarsan and phlogetanin, salvarsan and mercury, and Mirian strychnine. The evidence gathered by the author shows that there is no ground for the belief that tabetic atrophy has assumed a mild form in recent years, but it is noteworthy that among the cases seen in 1920 or 1925 no single one had been treated for syphilis by salvarsan and mercury. This statistical fact in Vienna is rather puzzling in view of the evidence that the number of cases of optic atrophy does not seem to have declined as it should have done if salvarsan treatment prevents the onset of optic atrophy. The most important conclusions which the author reaches are probably that there is no evidence that the more recent methods have exercised a favourable influence on the course of the disease, and that everything points to the fact that the best results in dealing with its progress are seen in those cases which are treated with **Potassium Iodide** only.

A series of 18 cases of tabetic optic atrophy have been reported by Jensch as treated by the **Swift-Ellis Method**, 7 of them in combination with injections of malaria. It will be remembered that the Swift-Ellis method consists of withdrawing a small amount of blood from the patient one hour after the intravenous injection of salvarsan. This blood is then centrifugalized, diluted with physiological saline solution, and, after the withdrawal of 10 c.c. of cerebrospinal fluid, is injected into the spinal theca on the day following the injection of salvarsan. According to the results obtained from the treatment the author divides his cases into three groups. In the first group, which included 7 cases, the patients all became blind, the blindness developing within periods ranging between two and seven months. In the second group, which also contained 7 cases, 4 showed stationary central vision accompanied by shrinkage in the visual fields, while in the remaining 3 both the central vision and the peripheral fields showed a gradual failure. Moreover, as these cases were under observation for short periods, ranging from four months to no more than two years, their ultimate fate is problematical. The third group consisted of 4 cases, in 2 of which the visual acuity improved a little, while in the last a slight improvement was followed by a relapse. Of the 7 cases treated by **Malaria** the results were so unsatisfactory that in the author's opinion it is doubtful whether the continuation of this method is justifiable.

Apparently it is possible to influence the Wassermann reaction of the blood and cerebrospinal fluid without influencing in the slightest the course of the tabetic atrophy of the optic nerve; and the conclusion forces itself upon us that the more complicated methods of treatment which have been elaborated during the past few years are not only useless but dangerous, and that the only reliable therapy is the old-fashioned method of prolonged courses of potassium iodide combined perhaps with bismuth. Unfortunately, of course, it must be admitted that the effect of this treatment is extremely slight at best, but in its favour it has the advantage that it is free from danger.

BIBLIOGRAPHY.—Jensch, *f. Augenheilk.*, 1930, lxxi, 12; John, *Ibid.*, 1929, lxxix, 283.

**OSTEITIS DEFORMANS.** (*See PARATHYROID GLANDS.*)**OSTEITIS FIBROSA, GENERALIZED.** (*See PARATHYROID GLANDS.*)**OSTEOGENESIS IMPERFECTA.** (*See also PARATHYROID GLANDS.*)

*Reginald Miller, M.D., F.R.C.P.*

H. A. T. Fairbank,<sup>1</sup> in his presidential address to the Children's Section of the Royal Society of Medicine, gives the results of his study of 28 cases of osteogenesis imperfecta. In this series the earliest fracture was known to have occurred at or before birth in 13 instances; in about one-third of the post-natal cases the first fracture occurred during infancy. Hereditary or familial influence could be traced in 28 per cent of the series, and was more common in the post-natal than in the ante-natal groups. Blue sclerotics were seen in 11 instances, 4 of which were ante-natal cases. This is of interest, as John Thomson stated that he had never observed the blue sclerotics in ante-natal cases. Fairbank was not able to trace any relationship between blueness of sclerotic and the severity of the disease. He is of opinion that there is no essential difference between the ante- and post-natal cases, that all are of intra-uterine origin, and that the date of the first fracture depends on the severity of the affection in the given instance. Regarding, therefore, all cases as properly included in one disease, he describes four types differentiated on clinical and pathological grounds:—

1. The thick bone type, best seen in a severe case soon after birth. This type is confined to ante-natal cases, and is seen only in the first few months of life.

2. The slender fragile bone type. This is the common type and is a development, if the patient survives, from the first type. The bones are usually, but not always, slender, with a thin cortex and a general want of density. There is an appearance of intense atrophy, and the extremities of the shafts may show some signs of honeycombing. Bowing is common, both from the occurrence of fractures and from bending of the shafts of the bones.

3. The honeycomb bone type, a rare form in which this abnormality of the bone is far more extensive than in Type 2.

4. The marble-bone type (Albers-Schönberg's disease).

**ETIOLOGY.**—In dealing with the very obscure subject of the causation of osteogenesis imperfecta, Fairbank expresses the hope that illumination may come by further research into the secretion and action of Robison's<sup>2</sup> ferment phosphatase, which is claimed to be an active agent in the process of normal ossification. In osteogenesis imperfecta there has been at present no research into the presence or absence of phosphatase. Estimation of the blood-calcium has rendered no help: in this disease it may be high or low.

**TREATMENT.**—Gorter<sup>3</sup> claims to have cured two cases of osteogenesis imperfecta by the use of **Thymus**: in one, 20 grm. of the fresh gland was administered daily; in the other compressed thymus was given. Both cases, unfortunately, were complicated by the presence of rickets, which makes the issue confused, though the author himself was satisfied that his claim was a just one in these two cases. On the surgical side of the treatment, Fairbank lays great emphasis on the wisdom of sacrificing the length of the bone to get perfect alinement free from all longitudinal tension with as wide an overlap as possible. If any tension remains, bowing will certainly ensue.

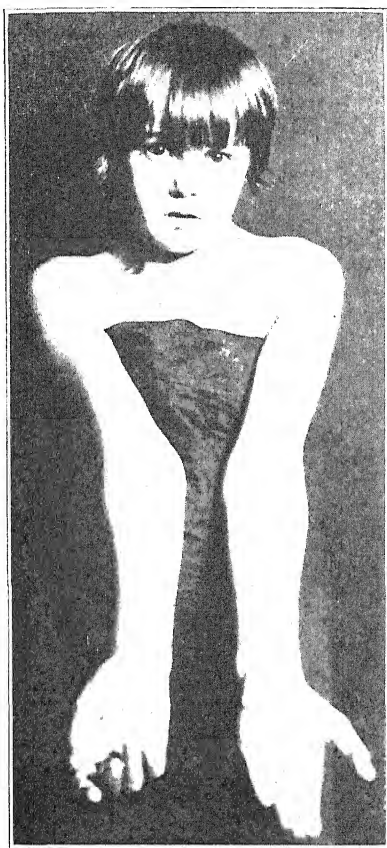
**REFERENCES.**—<sup>1</sup>*Proc. Roy. Soc. Med.* (Child. Sect., 77), 1930, July, 1263.; <sup>2</sup>*Brit. Jour. Exper. Pathol.* 1927, vii, 177; <sup>3</sup>*Ibid.*

**OSTEOMALACIA.** (*See PARATHYROID GLANDS.*)

## PLATE XLV

### OSTEOMYELITIS VARIOLOSA

(C. F. BIKEMBARY AND J. P. LECOCQ)



Late deformity associated with osteomyelitis variolosa. Front view, showing increase of carrying angle.

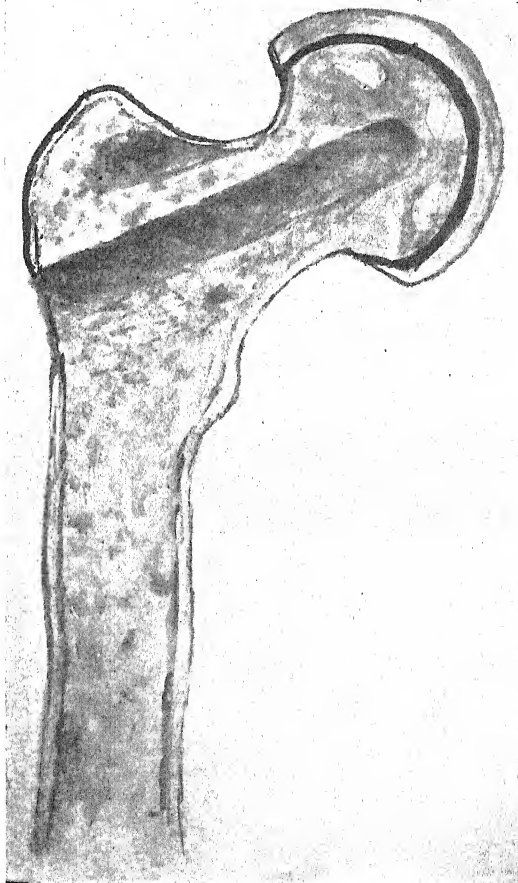
*By kind permission of the  
'Journal of the American Medical Association'*



**OSTEOMYELITIS.***John Fraser, Ch.M., F.R.C.S.Ed.*

C. F. Eikembary and J. F. Lecocq<sup>1</sup> record three cases of osteomyelitis arising in connection with small-pox—*osteomyelitis variolosa*—and it is evident that this variety of the disease has certain peculiarities. It is apparently unusual for the local error to be detected during the primary and general infection; it may be that the intensity and seriousness of the general symptoms overshadow local events, but another and more significant explanation is that the infection when deposited in the bone is remarkably minor and quiescent. In fact, the majority of examples of osteomyelitis variolosa have been detected not coincidentally with the small-pox, but years afterwards, when bone shortening and deformity (*Plate XLV*) call attention to the preceding events.

Acute osteomyelitis of the head and neck of the femur is discussed in two papers. O. L. Miller<sup>2</sup> describes an acute transient epiphysitis of the hip-joint, in which symptoms subside without the necessity for operation. The condition arises secondarily to a tonsillar infection, and, though the bacteriology is not discussed, it seems likely that a streptococcus is the infecting organism. The treatment includes rest in bed, light traction on the affected limb, and removal of the distant focus of infection. It was significant in this respect that in 82 per cent of



*Fig. 76.*—Cervical tunnelling operation for femoral epiphysitis, showing usual site of drill hole. (By kind permission of the 'American Journal of Surgery'.)

the cases symptoms subsided rapidly following **Tonsillectomy**.

K. H. Aynesworth<sup>3</sup> records his impressions of a similar disease, probably more intense in degree, and treated by 'Drill Trephine' Drainage through the trochanter, neck, and head of the femur (*Fig. 76*). Ten cases are reported, and the record that the subsequent stay in hospital varied from ten to twenty-two days suggests that the infection was not a very severe one.

C. E. L. Burnam<sup>1</sup> gives an account of the treatment he has found most suitable in the characteristic acute osteomyelitis. The points may be summarized as follows. If drilling of the bone reveals infection of the marrow, the cortex is removed until healthy marrow is exposed, the wound is then dried, washed, and swabbed thoroughly with methylated spirit, and dried again. **B.I.P.P.** is then rubbed in thoroughly everywhere, the excess being removed. A plug of gauze smeared with vaseline is packed into the bone cavity, and silkworm gut sutures are passed through the skin and tied lightly. A dressing of gauze, wrung out of methylated spirit, is applied, and the limb secured in a splint so that the joints above and below the part are controlled. If pulse and temperature remain satisfactory, the wound is not touched for three or four days; if there should be a local or general discomfort, the wound is dressed at the end of forty-eight hours. The gauze plug is removed with the help of a hydrogen peroxide solution—a plan which lessens discomfort and prevents oozing. The wound is then thoroughly irrigated with either saline, sodium bicarbonate solution, weak methylated spirit, Dakin's solution, cusol, or some other such lotion (the author does not attach much importance to the type of lotion employed, so long as it is weak and copious, and a change is frequently made from one type to another). Meanwhile the general treatment receives attention; an autogenous **Vaccine** is exhibited, and in urgent cases an **Anti-serum** is given. **Iron, Phosphorus, and Calcium** are administered, together with  $\frac{1}{10}$  gr. of **Parathyroid Extract**, and 2 min. of **Tincture of Iodine**; **Ostelin** in doses of 1 to 2 min. is also recommended.

That the operation of shaft resection, or **Diaphysectomy**, is favoured by certain French surgeons is evident from two papers contributed to the National Society of Surgery of France by M. G. Carajanno Poulos<sup>5</sup> and by N. Barret.<sup>6</sup> The former records his results in eight cases of acute osteomyelitis treated by diaphysectomy, while the second contributor mentions six cases. Both authors appear to be satisfied with their results, but the discussions which followed these papers revealed much opposition and criticism. The method has been to a great extent abandoned in this country in the acute stage of the disease for two reasons—its considerable immediate mortality, and the risk that bone regeneration may not occur. Its employment in the chronic stage is less open to criticism, but at this stage it is more akin to a sequestrectomy.

In recent years the operation for acute osteomyelitis has tended to become less extensive; the satisfactory results of the multiple drilling procedure of Starr has influenced many surgeons in this direction. A. Avonia,<sup>7</sup> and E. Kuster<sup>8</sup> view a tendency towards conservatism with apprehension, and their respective papers insist on the importance of early and complete operation, and the free opening of the cortex so as to expose the medulla to the fullest extent necessary.

REFERENCES.—<sup>1</sup>*Jour. Amer. Med. Assoc.* 1931, Feb. 21, 584; <sup>2</sup>*Ibid.* 575; <sup>3</sup>*Amer. Jour. Surg.* 1931, April, 80; <sup>4</sup>*Jour. Med. Assoc. S. Africa*, 1930, Oct. 11, 579; <sup>5</sup>*Bull. et Mém. Soc. de Chir.* 1931, June 27, 915; <sup>6</sup>*Ibid.* May 16, 915; <sup>7</sup>*Policlinico*, xxxvii, No. 32, 1165; <sup>8</sup>*Deut. Zeits. f. Chir.* 1930, July, 1.

E. W. Hey Groves, M.S., F.R.C.S.

S. J. H. Griffiths, F.R.C.S.

The problem of the treatment of osteomyelitis is still one which engages the earnest attention of all surgeons occupied in bone work. We have no hesitation in saying, however, that the lapse of time has fully confirmed the immense value of the work of Winnett Orr and placed this in the forefront of modern methods. We have already described this method (*see MEDICAL ANNUAL*, 1929, p. 326) and shall have occasion to refer to it again at the end of this article.



But there has arisen yet another method even more revolutionary and startling than that of Orr, and this too from America.

**The Use of Maggots in the Treatment of Infected Wounds.**—To the surgeon or to the laymen the very foulest idea of filthy wounds is conveyed by the fact of such wounds teeming with living and visible vermin in the form of fly maggots. But apart from this natural prejudice, it has been noted by impartial observers for hundreds of years that wounds which crawl with maggots heal as well as, or better than, those which present no visible parasites. Thus H. I. Goldstein<sup>1</sup> points out that Paré (1557) and Lairey (1766-1842) and many other writers observed that maggot-infected wounds healed well. Lairey claimed that this infection promoted the cicatrization of wounds by cutting short the process of Nature. He pointed out that the larvæ were "greedy only after putrefying substances, and never touch the parts which are endowed with life".

W. L. Baer<sup>2</sup> had his attention forcibly turned to this subject in 1917, when two soldiers in France who had received severe compound fractures with large flesh wounds, and who had lain out in no-man's-land for seven days, were brought in in a state of great starvation and exhaustion, their wounds crawling with maggots. But these men had no fever or constitutional signs of infection, and, moreover, when the insects were washed away the wounds had no pus, but were filled with healthy pink granulation tissue. Meditating on these facts for ten years, Baer at last determined to find out by further experiment on animals and human subjects whether these natural scavengers could be made use of to hasten the healing of infected wounds. In 1928 four children suffering from chronic osteomyelitis, each of whom had been operated upon three or four times, were treated by the application of large quantities of maggots. This was done after preliminary mechanical cleansing of the wounds, but without the use of any antiseptic. At the end of six weeks all the cases had healed, not only in the deeper structures but even to the skin. Further observation and experiment, however, gave pause to what promised to be so simple. Bacteriological examination of the maggots and of the wounds showed that in addition to ordinary pyogenic bacteria, there was a frequent contamination with anaerobic organisms, both those of gas gangrene and tetanus. Not only were these organisms found, but the disease of tetanus actually developed in eight cases and proved fatal in one case, in spite of the injection of antitoxin. For the moment this appeared to present an absolute bar to the use of the method; but Baer and his assistants succeeded in overcoming the difficulty after a long series of animal experiments. They made an intensive study of the blow-fly, with a view to breeding sterile maggots, and in this they have been successful. The flies must be bred for several generations in incubators specially warmed and lighted and provided with suitable moisture. Before egg-laying the flies are fed on a mixture of honey, yeast, and water. When laying they are supplied with cubes of raw beef.

The eggs when laid are collected and kept in an ice-box for twenty-four hours and then sterilized by washing in a solution of bichloride of mercury, containing 1-2000 of the mercury salt, 25 per cent alcohol, and  $\frac{1}{2}$  per cent of hydrochloric acid. The eggs are shaken in this for thirty minutes and then washed. They are placed on sterilized food, consisting of agar, yeast, and pig's liver. After one day the eggs hatch out and can be cultured to ascertain if bacterial sterilization has been efficient. The day after the young larvæ are ready for use.

The wound is washed with water, opened up in such a way as to expose the depths to the surface, and any gross sequestra are removed. If much hemorrhage occurs, the wound is packed with sterile gauze for twenty-four hours,

after which the whole wound is filled up with the living maggots. The edges of the wound are protected by adhesive plaster, which prevents any tickling by the maggots, and the wound is then covered by a fine-meshed wire net cage. The wound so covered by the cage is exposed to the sunlight and the air. This has the effect of making the maggots bury themselves in the depths of the wound. At the end of five days the cage is removed and the maggots are washed out. The wound is noticed to be clean, odourless, and of markedly alkaline reaction. Fresh batches of maggots are inserted every five days, and in about six to seven weeks in children the wound has healed, the process taking rather longer in adults. (*Fig. 77.*)

Baer is now in a position to give the details of no fewer than 89 cases of chronic osteomyelitis treated by this method. Most of them had had previous operations. The number of times that the maggots were inserted varied from three to thirty, and the duration of the treatment until healing occurred was from a few weeks up to two years.

One cannot pass this extraordinary piece of work without making a few comments and criticisms—first, of admiration for the thoroughness of Baer's



*Fig. 77.—Showing maggots at work in wound. (By kind permission of the 'Journal of Bone and Joint Surgery'.)*

work and his success in overcoming the great difficulties both of prejudice and bacterial dangers. We must admit that he has fully proved the possibilities of employing the living maggot for the cleansing and healing of an infected bone wound; but it must be obvious that the method has such drawbacks and limitations that it is not likely to find a place in established modes of

treatment. In the first place the details necessary to be observed in the breeding of the flies and the sterilization of the maggots make it impossible of application under ordinary circumstances. Secondly, even taking his own cases, the length of time necessary for treatment is not so much shorter than that taken by the Orr method as to make any striking argument for its use. Thirdly, the method makes a great demand on the services of highly trained nurses and assistants, and necessitates continuous attention in a special hospital, with dressing every five days. And it must be a distressing business, to say the least of it, for a sensitive child to have crawling living creatures placed in its wound. Compare all these features with the Orr method in which the technique is so simple and the dressings are changed only once in eight weeks, and we find it difficult to believe that maggot treatment is anything more than a surprising demonstration of a freak method which few will care to carry out.

**Winnett Orr's Method.**—J. Kulowski<sup>3</sup> gives a recent series of 130 consecutive cases of osteomyelitis treated by Orr's method which should serve to prove that this is now widely adopted and that it gives the best results with which we are acquainted.

The method is a wide opening of the wound, exposure of the deep parts with removal of necrotic tissue, drying of the wound with application of iodine and then spirit, packing the widely open wound lightly with vaseline gauze, and

fixation of the whole limb in a plaster cast without a window, and leaving the limb without change of dressing for from four to eight weeks. The most striking feature of this group of cases is the fact that in 130 cases the average duration of hospital treatment was only thirty days. The average time of healing was seven and a half months.

REFERENCES.—<sup>1</sup>*Jour. Bone and Joint Surg.* 1931, July, 476; <sup>2</sup>*Ibid.* 438; <sup>3</sup>*Ibid.* 538.

**OTITIS MEDIA.** (See EAR, AFFECTIONS OF.)

**OTOSCLEROSIS.** (See PARATHYROID GLANDS.)

## OVARY.

W. Langdon Brown, M.D., F.R.C.P.

J. B. Collip,<sup>1</sup> continuing the researches referred to in the last number of the MEDICAL ANNUAL (p. 343), has described three distinct hormones in the human placenta, whereas lower mammalian placentas yield only œstrin. The second, to which the name 'Emmenin' has been given, though similar to œstrin, is much more effective by oral administration and appears to stimulate the intact ovary. The third is the anterior-pituitary-like substance. In conjunction with A. D. Campbell<sup>2</sup> he finds that the second is useful in dysmenorrhœa, polymenorrhœa, and some cases of recent amenorrhœa, while the third arrests certain forms of metrorrhagia. Gardiner Hill and Forest Smith,<sup>3</sup> working with the standardized **œstrin** described by E. C. Dodds and J. D. Robertson (see MEDICAL ANNUAL, 1931, p. 344), obtained closely similar results to these observers. In primary amenorrhœa no benefit was derived, but in secondary amenorrhœa or primary irregularity positive results were obtained in about half the cases. In twelve of the successfully treated cases the subsequent menstrual cycle was normal without further treatment. In two of these patients, who were sterile, pregnancy subsequently occurred.

W. Schoeller, M. Dohrn, and W. Hohlweg<sup>4</sup> report good effects from oral administration of **Follicular Hormones** when given in an aqueous or in a mixture of aqueous and alcoholic solutions; oily solutions were much less effective. J. P. Pratt and M. Smeltzer<sup>5</sup> have applied Blumgart's method of nasal administration to ovarian hormones.

Since Fränkel's observations on the inevitable abortion following destruction of the corpus luteum by galvanocautery it has been held by most observers that the presence of a corpus luteum is necessary to maintain the due implantation of an ovum in the uterine mucosa. M. Douglas<sup>6</sup> has, however, reported a case from which it appears that human pregnancy may be independent of the luteal hormone once its duration exceeds four to six weeks.

REFERENCES.—<sup>1</sup>*Canad. Med. Assoc. Jour.* 1930, Nov., 631; <sup>2</sup>*Ibid.* 633; *Brit. Med. Jour.* 1930, ii, 1081; <sup>3</sup>*Lancet*, 1931, i, 464; <sup>4</sup>*Med. Jour. and Record*, 1930, Nov. 19, 487; <sup>5</sup>*Endocrinology*, 1929, Aug., No. 4; <sup>6</sup>*Surg. Gynecol. and Obst.* 1931, Jan., 52.

**OVARY AND FALLOPIAN TUBES, HERNIA OF.** (See HERNIA OF THE OVARY.)

## OVERCROWDING.

G. E. Oates, M.D., M.R.C.P., D.P.H.

Overcrowding is a sanitary defect that may be found in any dwelling-house, whether of good or bad construction. It may have serious results as regards the health and happiness of the persons affected, and is found in association with an increased incidence of chest diseases, infectious diseases, and the fatal diseases of infancy. The reasons for this association merit careful examination, since the physical dangers of overcrowding can be mitigated by the exercise of certain precautions. It is still widely held that overcrowding is mainly

harmful in so far as it causes vitiation of the air of the dwelling-room, and great emphasis is laid by some on the adequate ventilation or replacement of the air. Some support is given to this idea from the fact that headache and languor frequently appear after a stay in a badly ventilated room. There appears also to be some justification for stating that those who habitually live or work in badly ventilated rooms suffer from anemia and debility. It was at one time thought that defective ventilation was harmful owing to the accumulation of carbon dioxide and the presence of exhaled organic matter. Very little importance was attached to the presence of the water vapour which is abundantly present in expired air. It is now known that it is water vapour which causes the sensations which are associated with stuffiness. After being exhaled from the lungs or given off from the skin it tends to linger in the neighbourhood of the body, and hinders the capacity of the body to regulate its temperature by the further elimination of water vapour. This 'heat stagnation', as it is termed, accounts for most of the temporary discomforts associated with bad ventilation. Fortunately it admits of an easy remedy, that of directing a current of air so as to dissipate the excess of moisture present. This is commonly effected by the opening of windows, but a crowded room may be 'cooled' and the sense of oppression largely removed by churning the air of the room with an electric fan, even without flushing the air by the opening of windows.

The phenomenon of heat stagnation may well account for temporary discomfort, but the proved association of certain diseases with overcrowded conditions cannot be explained in this way. As for the excess of carbon dioxide in the air, this has been proved by actual experiment on human subjects to be of minor importance. The amount present, even in the most crowded theatres, is never sufficient to cause any discomfort of itself. It appears to be the organic content of expired air, and more especially the bacterial content, which is harmful to health. In the air exhaled from the lungs bacteria of the kinds found in the respiratory passages are normally present. During certain acts, such as speaking and coughing, the number of bacteria is greatly increased owing to the discharge of minute particles of mucus and saliva in the form of droplets. These usually float in the air for a few feet and fall to the ground, so that in a sparsely occupied room the communication of bacteria from one individual to another does not take place to any great extent. Under conditions of overcrowding this interchange of bacteria becomes of importance, and bacteria from the respiratory passages of a person suffering from or carrying any catarrhal or infectious disease may penetrate in large numbers to the respiratory passages of other persons in close proximity. Such mass infection is thought to play a part in the spread of pulmonary tuberculosis and to explain the not infrequent occurrence of multiple cases in a household. Other catarrhal diseases such as pneumonia, measles, and influenza, are associated with overcrowding, and it is the constant and close proximity of individuals which is the chief danger. No efforts should be spared, whether it be in a school, a sleeping-room, or a hospital, to secure the maximum space possible being interposed between the individual occupants. The degree of ventilation or replacement of air is of less importance.

An important feature of overcrowding is the greater incidence of parasitic conditions. Lousiness is closely connected with overcrowding in the home, and especially with the sharing of beds by adults and children. Hence the association of typhus fever, a louse-borne disease, with overcrowding due to poverty and social distress. Certain of the so-called contagious diseases, such as scabies, ringworm, contagious impetigo, and ophthalmia, are commoner under overcrowded conditions. Apart from its association with disease,

overcrowding has certain bad social effects, such as the indecent occupation of sleeping-rooms by persons of opposite sexes, and increased nerve-strain owing to noise and worry. The resulting lack of privacy has the effect of dragging everyone down to the same level of squalor.

### PANCREAS, SURGERY OF.

*A. Rendle Short, M.D., F.R.C.S.*

**Acute Pancreatitis.**—According to De W. Stetten,<sup>1</sup> of New York, there is a premonitory condition of subacute pancreatitis or œdema of the pancreas, which is a commencing stage of acute pancreatitis. There is a history of previous recurrent attacks of pain, extending over months or years, which subside spontaneously until in one of them the fulminating symptoms of acute hemorrhagic pancreatitis supervene. These pains are severe, deep, and boring, in the epigastrium; they may radiate to the left, which distinguishes them from gall-stone colic. Deep tenderness is present, but no rigidity. There may be a slight rise of pulse and temperature. There may be an increase of diastase and lipase in the urine, and a duodenal tube may bring up contents deficient in pancreatic ferments. This, with a negative X-ray examination of the stomach and gall-bladder, should establish the diagnosis. The treatment recommended is **Cholecystectomy** with drainage of the stump of the cystic duct, together with exposure of the pancreas through the lesser omentum, and slitting of the peritoneum over the gland, without cutting the pancreas itself. The area is drained. Three cases are mentioned. [I have several times ventured to diagnose pancreatitis on evidence of the nature described in this paper, but have not felt justified in operating.—A. R. S.]

A rare sign in acute pancreatitis is a yellow discoloration around the umbilicus, due to extravasated pancreatic juice. L. B. Johnston<sup>2</sup> describes a case.

E. Eliason and J. P. North,<sup>3</sup> reporting a series of cases with 6 deaths out of 8 operated on early, and 5 all recovering after deferred operation, call attention to the practice of Danish surgeons (Rovsing, Holst) of following expectant treatment at first. Mikkelsen gives a series of 50 consecutive recoveries thus treated. [The Danish experience is remarkable, and well worth consideration. Nevertheless, in the ultra-acute type of case seen within a few hours of onset and with violent pain, it is my belief that the pain will be relieved, and nearly all the patients be saved, by immediate drainage of the pancreas, with or without cholecystostomy. It may be that when this stage has been missed, or in cases that begin less violently, delay will prove to be the best policy.—A. R. S.]

F. Ody,<sup>4</sup> of Geneva, calls attention to the value of a posterior drain in these cases. He exposes the pancreas in the ordinary way, and then inserts a drain into the lesser sac by an incision in the left renal region, in front of the renal vessels.

**Chronic Pancreatitis.**—There was a good discussion on this subject at the twenty-ninth Congress of French surgeons, introduced by P. Brocq, of Paris, and G. Miginiac,<sup>5</sup> of Toulouse. There are two main types clinically recognizable, in addition to cases of pancreatic diabetes; these are cirrhosis of the head of the pancreas with obstructive jaundice, and the type with recurring attacks of pain, which the authors say is probably commoner than is supposed. The surgical treatment is by some form of drainage. If the gall-bladder is reasonably healthy, it may be opened for prolonged external drainage, or anastomosed to the stomach or duodenum, whichever is easier. In a poor-risk patient, when attacks of pain are the main indication for interference, and in young people where cancer can be almost certainly excluded, cholecystostomy is better, because it is simple, and the drainage is not likely to fail. In a fit patient, when there is reason to doubt if the pressure of the head of the pancreas on the common

bile-duct will ever abate (as when cancer is suspected), cholecyst-gastrostomy or cholecyst-duodenostomy is preferable. The drainage may not remain perfect, but a troublesome discharge of bile is avoided. If the gall-bladder is diseased or full of stones, it may be necessary to remove it and drain the common duct externally. Cases of painful pancreatitis without icterus have been relieved, temporarily, by direct attack on the pancreas as described above (see Stetten's paper<sup>1</sup>).

**Pancreatic Cyst.**—A. Jurasz,<sup>2</sup> of Poznan, in Poland, has treated two cases by entering the stomach through the anterior wall, making a direct connection between the posterior wall and the cyst by means of the cautery, evacuating the cyst contents through the stomach, and closing the anterior incision. The cyst is left to drain permanently into the stomach; the orifice should be about an inch long. Both patients did well and became free from symptoms. A subsequent skiagram after barium showed a normal stomach. This method seems likely to be the best at our disposal. It avoids a permanent pancreatic fistula externally, and is safer than extirpation of the cyst.

REFERENCES.—<sup>1</sup>*Ann. of Surg.* 1930, Aug., 248; <sup>2</sup>*Jour. Amer. Med. Assoc.* 1930, 1587; <sup>3</sup>*Surg. Gynecol. and Obst.* 1930, Aug., 183; <sup>4</sup>*Presse méd.* 1930, Nov., 1628; <sup>5</sup>*Ibid.* Oct., 1422; <sup>6</sup>*Arch. f. klin. Chir.* 1931, Feb., 272.

**PARALYSIS, JAMAICA GINGER.** (See JAMAICA GINGER PARALYSIS.)

**PARALYSIS, SERRATUS MAGNUS.** (See SERRATUS MAGNUS PALSY.)

**PARAPLEGIA IN THE AGED.** *Macdonald Critchley, M.D., F.R.C.P.*

Every practitioner who has occasion to attend to the medical needs of a large number of old people realizes how often weakness of the legs occurs in the aged. Frequently the causation of such disorder is to be found outside the nervous system, in disease of the joints and ligaments. True senile paraplegia, however, is of neurological origin. Such cases vary considerably in severity as well as in clinical characteristics. The causation of the paraplegia is variable, and the responsible arteriosclerotic and senile changes may be encountered at different levels of the central and peripheral nervous systems.

M. Critchley<sup>1</sup> has described the clinical varieties of senile paraplegia as cortical, subcortical, spinal, and muscular. The cortical type is usually characterized by an abrupt weakness in one leg, followed on a later occasion by a weakness of the other. The patient then shows a spastic weakness of both lower extremities, with little or no impairment in sensibility; the tendon reflexes are exaggerated and there is an extensor type of plantar response.

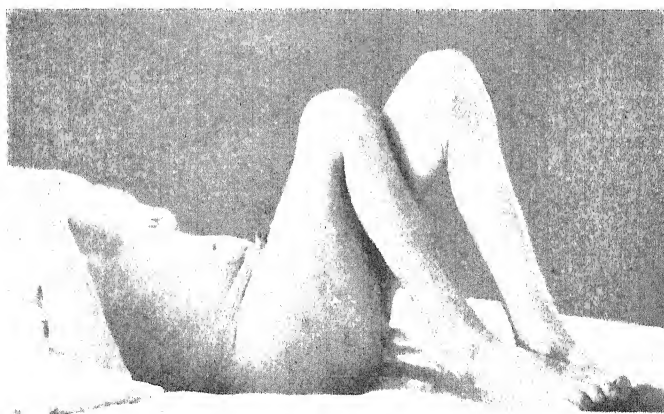
Incontinence does not occur, but if the patient's mental condition has deteriorated, there may be a carelessness in sphincter control and dirtiness of habits. Associated with the paraplegia there may be seen in the upper extremities curious spontaneous or involuntary movements. Paraplegia of this type depends upon bilateral occlusion of the anterior cerebral artery, a vessel which supplies only that portion of the motor cortex of the brain concerned with movements of the lower extremity.

The subcortical variety of senile paraplegia consists in a gradually progressive weakness and stiffness of the legs, accompanied by exaggeration of the reflexes and possibly by the appearance of Babinski responses. If the patient is bed-ridden, the legs rapidly assume an attitude of flexion with contractures (*Plate XLVI, A*). Sensory changes may occur, at times over one lower limb only. The upper limbs may show some lesser degree of stiffness and impairment of strength; and it is not rare to encounter

*PLATE XLVI*  
SENILE PARAPLEGIA  
(J. LHERMITTE)



*Fig. A.*—Case of senile paraplegia of subcortical type. At the autopsy there were found numerous 'lacunes' of disintegration in the corpus striatum; an old hæmorrhage was found under the left optic thalamus. The white matter of the centrum ovale was atrophied.



*Fig. B.*—Case of paraplegia due to senile myosclerosis.

*Reproduced by the courtesy of Professor Lhermitte, of Paris*





various 'pseudo-bulbar' symptoms—difficulty in articulation and in swallowing; salivation; emotivity even amounting to involuntary laughing and crying. The pathological basis of such a paraplegia consists in multiple softenings and 'lacunes' scattered throughout the white matter of the cerebrum and the basal ganglia.

Sometimes a subcortical type of paraplegia follows, after an interval, an apoplectic stroke. A hemiplegia develops, and if the patient takes to his bed, the paralysed leg gradually contracts into a position of permanent flexion at hip and knee. After some time the opposite unaffected limb may also gradually bend so as to assume a similar attitude. Signs of pyramidal disease will occur, of course, in the hemiplegic limb only.

When the paraplegia is of the spinal type, the signs comprise a symmetrical weakness of the legs of either sudden or gradual onset. A pyramidal type of spasticity is present and the legs ultimately assume an attitude of flexion. Sensory changes are demonstrable in the legs; wasting of the muscles and fibrillation may also be present. Sphincter control is usually much impaired. Such a type of senile paraplegia is due either to sudden softenings of the cord from occlusion of one of the larger vessels, or to a gradual process of ischaemia from progressive vascular sclerosis. In the former case the onset of symptoms will be abrupt; in the latter the paraplegia will be slow in onset.

Actually the commonest type of senile paraplegia is the fourth or 'muscular' variety, originally described by J. Lhermitte.<sup>2</sup> Here, there occurs a progressive fibrosis of the muscles of the lower limbs leading to hardening and impairment of function; changes in the central nervous system are not necessarily present although frequently coincidental. This type of paraplegia is characterized by a gradual stiffness and weakness of the legs, accompanied by wasting and vague pains. The legs become fully flexed and cannot be straightened by passive manipulations (*Plate XLVI, B*). Powerful contractures develop around the joints, and the tendons and muscle-bellies stand out prominently. On palpation the muscles—particularly those of the extensor group—are hard and wooden and are distinctly tender. No sensory or sphincteric disorders occur; the tendon reflexes are usually unobtainable; plantar responses are flexor in type.

**Disorders of Gait.**—Apart from these cases of gross paraplegia, most aged people show numerous minor alterations in the character of the gait. Such alterations merge gradually into the more severe types of paralysis.

Even in so-called 'healthy old age' there is a certain loss of elasticity in the walk, with shortening of the steps and widening of the base. If this gait becomes exaggerated, a bent attitude is assumed, and the patient walks slowly in a series of very short steps, as though he were tottering forwards. This particular gait is usually described as the '*marche à petit pas*' and recalls the gait of the Parkinsonian. As the patient becomes feebler, a subcortical type of paraplegia gradually develops.

Cerebellar disease in old people is a much rarer cause of difficulty in walking. Here there is a reeling, inco-ordinate gait with frequent falls. Sometimes the wild ataxia raises the suspicion of hysteria. Especially is this so in the case of the so-called *Petrén's gait*.<sup>3</sup> Here the patient, having taken a few steps, feels he can go no farther without falling; but, upon encouragement, by concentrating upon the individual movements of the legs, he can proceed. For a detailed discussion of the mechanism of these 'astasia-abasias of the aged' the reader is referred to the classical monograph of von Malaisé.<sup>4</sup>

REFERENCES.—<sup>1</sup>*Lancet*, 1931, i, 1221; <sup>2</sup>*Etude sur les Paraplégies des Vieillards*, Paris, 1907; *L'Encéphale*, 1928, xxiii, 89; *Nouv. Icon. de la Salp.* 1906, xix, 255; <sup>3</sup>*Arch. f. Psych.* 1900, xxxiii, 818; 1901, xxxiv, 444; <sup>4</sup>*Ibid.* 1910, xlv, 902.

## PARATHYROID GLANDS.

*W. Langdon Brown, M.D., F.R.C.P.*

**The Parathyroids and the Metabolism of Calcium and Phosphorus.**—Donald Hunter,<sup>1</sup> in an important critical review of calcium and phosphorus metabolism in relation to the parathyroids, places the daily calcium requirement of an adult at 0.4 to 1.0 gm., while more is required until the skeleton is completed. Calcium salts are not easily absorbed, and while it is true that the chloride raises the serum calcium more than the lactate, it does so partly by producing an acidosis. While vitamin D is the main factor governing the absorption of calcium, it is not so clear that it directly affects its utilization in the tissues. It is generally accepted that calcium is excreted by the large intestine and to a less extent by the kidney. By the latter route from 0.1 to 0.5 gm. is excreted daily, but this can be increased by an acid-forming diet, i.e., meat, starch, and sugar, but excluding milk, green vegetables, and fruit. There is hardly any calcium in the red corpuscles, while the most reliable methods place the serum calcium at from 9 to 11 mgrm. per 100 c.c. Since the cerebrospinal fluid contains only 5 to 6 mgrm. per 100 c.c. it is clear that some of the blood calcium is present in a non-diffusible form. The serum calcium is highest during the suckling period, and falls during pregnancy, no doubt on account of the demands of the fetus. The statement that it rises before and falls during menstruation is based on faulty methods and is not substantiated. In the soft tissues calcium is generally present in about the same amount as in blood, but muscle contains 6.5 mgrm. and bone 10 gm. per cent. It has perhaps been insufficiently emphasized that the skeleton is not only a supporting structure but also a reservoir of calcium and phosphorus. Calcium-ions help to control the heart-beat, the contractility of plain and striped muscle, and the transference of impulse at the neuromuscular junctions and through synapses. In general, calcium-ions lessen the irritability of the tissues containing them. Nevertheless wide variations can exist without apparent interference with such functions; the content can drop to 6 mgrm. before tetany develops, while in hyperparathyroidism there may be no symptoms with figures such as 16.7 or 19.8 mgrm. The rôle of calcium in the clotting of blood and milk is well known.

Phosphorus is taken as nucleoprotein in meat, phosphoprotein in milk, lecithin in egg-yolk and liver, and as inorganic phosphates. The plasma and the corpuscles of the blood contain equal amounts of inorganic phosphorus, the total varying from 2.5 to 3.5 mgrm. per cent. There is often, but not invariably, a reciprocal relationship between the calcium and inorganic phosphorus in the blood. Phosphorus compounds take part in at least four important metabolic processes: the storage of carbohydrate, the chemical changes preceding muscular contraction, acid-base equilibrium, and deposition of bone. In these processes certain widely distributed enzymes, the phosphatases, are essential.

Although the effect of *parathormone* in raising the calcium in the blood by increasing the excretion from the bones is the best known, its primary action appears to be an abrupt increase of the urinary excretion of phosphorus. If the administration is contained in large doses, however, and the blood calcium reaches a certain height, this effect is suddenly reversed and the blood phosphorus rises again. Curiously enough, parathormone is the only known hormone to which the body acquires 'immunity'.

The isolation of parathormone led to the recognition of a new entity—hypercalcemia, as opposed to the earlier recognized hypocalcemia leading to tetany. But now a spontaneous hypoparathyroidism causing similar symptoms to post-operative tetany and relieved by parathormone is recognized, though as a rare condition. In both, lesions of ectodermal tissue such as cataract, brittleness and ridging of the nails, and loss of hair and dental enamel, are characteristic,

especially cataract. Experimentally the injection of parathormone, particularly when the intake of calcium is low, leads to resorption of bone and its replacement by fibrous tissues and cysts.

*Generalized Osteitis Fibrosa.*—This was first described by von Recklinghausen in 1891, and distinguished from osteomalacia. He regarded the brownish-red projecting tumours accompanying the bony changes as osteosarcomata, but we now know them to be innocent and composed of cells similar to osteoclasts. This condition is quite distinct from focal osteitis fibrosa, in which the calcium metabolism is normal, and in which operation is unjustifiable. In 1901 Askanazy described a case of generalized osteitis fibrosa in association with a parathyroid tumour, but the significance of the association was missed. However, from 1907 when Erdheim described three cases of osteomalacia with parathyroid tumour, observations of the association gradually accumulated. It was also noted that renal calculi were frequent, while areas of metastoid calcification were found in the lungs, stomach, kidneys, and myocardium. Whether the bony disease or the parathyroid tumour was primary, was hotly disputed for a time. The earlier operations of Mandl (1926) and others, which proved that removal of the tumour improved the bony disease, have already been recorded in the MEDICAL ANNUAL for 1930 (p. 388) and 1931 (p. 345).

The year 1926 also saw the observations of Hannon and others that the calcium content was raised, and that of phosphorus lowered, in the blood in this disease. Three years later Richardson, Aub, and Bauer showed that the urinary output of these substances was six to seven times greater than normal, and that the metabolic changes were equivalent to those produced by 100 units of parathormone daily.

Satisfactory proof of *hyperparathyroidism* now exists in 32 cases of generalized osteitis fibrosa. In 27 of these a parathyroid tumour or tumours were found at operation or necropsy. In the remaining 5 cases no tumour was found. In only 5 cases, however, was the tumour large enough to be felt in the neck. In the majority of cases bony pains were immediately abolished by operation; in one case renal calculi began to break up. In many cases the levels of serum calcium and plasma phosphorus and the urinary excretion of calcium were restored to normal. Tetany after the operation is common, even before the serum calcium has returned to normal. Symptomatic improvement is more marked than radiographic evidence of bony improvement. The osteoclastic tumours have, however, been observed to disappear.

Although it has been thought that the parathyroid tumour initiated the bony changes in generalized osteitis fibrosa, parathyroid hyperplasia is known to occur secondarily to abnormal conditions of the skeleton such as osteomalacia, secondary carcinoma of bones, and multiple myelomata, while the histological appearances in Paget's disease—osteitis deformans—closely resemble those of generalized osteitis fibrosa, without any evidence of parathyroid tumour. All this, in Hunter's opinion, suggests caution in attributing the prime factor to the parathyroid tumour and in expecting too much from operation.

*Myelomatosis.*—This work arouses new interest in myelomatosis. When Bence-Jones first described the urinary protein known by his name he thought the case was one of osteomalacia. It was not until 1889 that Kallier showed this substance to be associated with multiple myelomata. Metastatic calcification has been observed, and the bony destruction leads to a high blood calcium, but also to a high blood phosphorus, unlike generalized osteitis fibrosa. H. A. Bulger, H. H. Dixon, and D. P. Barr<sup>2</sup> have described a case of myelomatosis with parathyroid hyperfunction, but without Bence-Jones proteinuria. It seems logical to assume that in certain cases of myelomatosis hyperparathyroidism exists as a complication. But this is by no means the rule.

*Hyperthyroidism.*—In hyperthyroidism or in normal individuals on thyroxin there is a great increase in calcium excretion, while this is diminished in myxœdema. Yet there is no hypercalcæmia. It is remarkable, therefore, that thyroid extract has a striking effect in raising the calcium content of the blood in parathyroid tetany.

It is the more remarkable since hyperthyroidism is the only known condition in which there is a distinct increase in the faecal excretion of calcium. These changes are not simply due to an increased basal metabolic rate, as they do not occur in fevers; they would appear to result from increased katabolism of bone. This is corroborated by the radiographic appearance of the bones in Graves' disease, which reveals poverty of calcium and osteoporosis in something under half the cases.

The amount of calcium which is absorbed from the alimentary tract appears definitely to be increased by **Irradiated Ergosterol**, and if this occurs when the body needs calcium, there will be increased deposit of it in the bones. But with overdosage hypercalcæmia, renal calculi, and metastatic deposits will occur, while the bones may show osteoporosis. Ergosterol irradiated in an oily solution, i.e., analogous to natural irradiation of the skin, is much less toxic than when it is irradiated in an alcoholic solution. Yet the former is capable of exciting the production of calcium phosphate calculi in the urinary tract, which is of interest in the etiology of tropical urolithiasis.

*Rickets.*—While the importance of vitamin D in the control of rickets is now clearly recognized, it is also to be noted that as long as the ratio of calcium to phosphorus in the food is kept at an optimum level, rickets does not develop even in the complete absence of antirachitic substances from the diet. But if the ratio is markedly disturbed in either direction, together with a deficiency of vitamin D, then rickets develops. McCollum and his co-workers created in this way two forms of experimental rickets—one with paucity of phosphorus in the diet, histologically resembling the clinical form, and the other with paucity of calcium in the diet, which showed osteoporosis in addition.

*Osteomalacia.*—This shows changes similar to rickets, in the deficient calcification of osteoid tissue, due to lack of vitamin D. In the majority of cases the serum calcium is low as in low-calcium rickets. In both diseases prompt return to normal follows the use of **Cod-liver Oil**, **Ultra-violet Light**, or **Irradiated Ergosterol**, and ossification begins to proceed normally. In addition to the great bony deformities, tetany is very common in osteomalacia. The influence of pregnancy in inducing the condition is well known, while the effect of prolonged lactation in draining calcium from the patient is readily comprehensible. There is hyperplasia of the parathyroids, which is probably compensatory since it affects all of them. The prevalence of the disease in Chinese women is explicable when one remembers that the binding of the feet and the strict purdah mean systematic screening from sunlight from the age of ten. Their diet is meagre and they eat no raw vegetable or fruit, largely from fear of cholera. Lactation commonly goes on for as long as four years. It is not surprising that other deficiency diseases coexist with osteomalacia. J. P. Maxwell finds that some cases in China require as much as an ounce and a half of cod-liver oil with 1 mgrm. of irradiated ergosterol daily. But he adds, "we also want flocks and herds, milk and meat, with security of life and property."

*Antenatal Rickets*, as originally described by Virchow, really included many other diseases, such as achondroplasia. Maxwell has adduced radiographic evidence of true rickets in the newborn babies of osteomalacic mothers. Turnbull found evidence of infantile scurvy in some of these.

*The Influence of Diet on the Structure of the Teeth* has, as is well known, been demonstrated by M. Mellanby, who showed that a diet deficient in vitamin D, particularly if rich in the so-called rachitogenic cereals as well, induced dental caries. More recently Walkhoff has demonstrated in guinea-pigs a similar effect in the case of vitamin C.

*Hunger Osteopathy.*—This, as seen in Central Europe between 1917 and 1919, resembled early and slowly progressing osteomalacia. The majority of patients were elderly, and although adolescents between 14 and 20 were also attacked, children from 6 to 14 were absolutely spared, and people from 30 to 35 were almost wholly immune. Tetany was not infrequent. Schmorl found great enlargement of three of the parathyroids in one case. **Cod-liver Oil** was a specific.

*Celiac Rickets* and spontaneous fractures occasionally occur in the form of infantilism accompanied by severe chronic intestinal indigestion described by Gee as the 'celiac disease', which is now generally attributed to defective fat absorption. The serum calcium is constantly low, as is the plasma phosphorus occasionally. Tetany is commonly present. Celiac rickets can be completely cured, even when the child is on a fat-free diet, by **Ultra-violet Rays** or **Irradiated Ergosterol**. In the idiopathic steatorrhœas of adults (including some cases of sprue) bony deformities, tetany, and a low serum calcium frequently occur. Achlorhydria is common and the blood-sugar-tolerance curve may be low. Here again the chief factor in the calcium defect is a failure to absorb vitamin D. Linder and Harris showed that the formation of insoluble calcium soaps in the bowel is not an important factor in preventing calcium absorption. The best treatment is irradiated ergosterol. (*See also CELIAC DISEASE.*)

*Renal Rickets.*—The association between renal disease in early life and bony changes was first pointed out by Morley Fletcher in 1911 and reinforced by Barber in 1913. The condition is distinct from true rickets and is not due to a lack of vitamin D but to a disturbance of calcium and phosphorus metabolism for which the chronic nephritis is responsible. The former tends to fall as the latter rises, hence the high incidence of tetany.

*Osteitis Deformans* (Paget's disease) has one significant histological difference from generalized osteitis fibrosa—apposition of new periosteal bone preponderates over the resorption of cancellous bone instead of the converse. The parathyroids are not involved, and the blood calcium and phosphorus are approximately normal. The plasma phosphatase is, however, constantly high.

*Osteogenesis Imperfecta.*—The basic defect appears to be an inability to produce osteoblasts. The cranial ossification may be so disorganized that the vault of the skull is a mosaic of small wormian bones. Fracture of bones from slight trauma is common. Three other defects are commonly associated with the fragile bones—blue sclerotics, a tendency to dislocation of joints, and after the age of twenty, otosclerosis. No constant biochemical changes have been demonstrated. Garrod classes the condition among the inborn errors, and its familial transmission is well established. (*See also OSTEOGENESIS IMPERFECTA.*)

*Otosclerosis* was first recognized by Toynbee in 1841. It is often hereditary and occurs most frequently in females in whom its onset is associated with puberty, pregnancy, and lactation; it is progressive but is usually arrested at the menopause. Although it is associated with generalized diseases of bones (though rarely with osteitis fibrosa) no consistent evidence of disturbed calcium metabolism or parathyroid function is forthcoming.

The close analogy between the *storage and excretion of lead and of calcium* was referred to in the MEDICAL ANNUAL for 1931 (p. 348). Apparently large

quantities of lead may be stored in the bones and excreted gradually in minute amounts over long periods. Aub and Minot found that the rate of excretion could be markedly increased if lead workers were put on a low calcium diet and given either hydrochloric acid, phosphoric acid, or ammonium chloride in large doses, probably due to the formation of a more soluble lead salt. As previously reported, parathormone at first causes rapid excretion of lead from the bones, but this action slows down. Other elements show a selective localization in bone, such as arsenic, mercury, lithium, strontium, and radium. Flinn and Seiden have used parathormone to eliminate radium from the bones of factory workers who may develop necrosis of the jaw and aplastic anaemia, alpha radiation being enormously destructive of the bones in which it is stored, and also of the adjacent haemopoietic marrow.

**Calcium Salts in Therapeutics** have proved disappointing, because the constant supply of calcium in the food and the large stores in the bones make it unlikely that direct shortage is responsible for symptoms. It is when some part of the regulating mechanism fails that the tissues suffer from calcium deficiency. It therefore follows that the use of cod-liver oil, ultra-violet light, irradiated ergosterol, parathyroid or thyroid extract is often of greater value than the direct administration of calcium salts. But in some countries the ordinary diet requires reinforcing in this respect, as it does for pregnant or lactating women and in exophthalmic goitre. Also tetany, laryngismus, and lead poisoning call for the administration of calcium salts with or without other measures. In the case of lead colic, the calcium salts have a further effect as an antispasmodic on involuntary muscle. By the same method Aub has brought about prompt relief in renal and gall-stone colic. As this has no effect on the pain of appendicitis, the treatment also helps in differential diagnosis.

**Acute Necroses of the Liver.**—It has been observed that a low calcium diet rendered dogs more susceptible to carbon tetrachloride poisoning. The symptoms are gastro-intestinal irritation and hyperexcitability, followed by depression. There is a retention of guanidine in the blood and a hypoglycaemia. Administration of calcium salts relieved the symptoms, largely by antagonizing the guanidine. In some cases of hepatic disease in the human subject, especially in eclampsia, similar metabolic changes were observed and the symptoms were relieved by 10 c.c. of a 10 per cent solution of calcium gluconate intravenously.

**Edema and inflammatory exudates** have been relieved by the diuretic action of calcium chloride, but it is not a specific action of calcium salts; it apparently results from a change in the ion-balance in the body fluids. Fraser suggests that it is merely due to the acid properties of the salt, as ammonium chloride acts in the same way.

In *chilblains* the evidence of benefit from calcium salts is unsatisfactory. In *urticaria* calcium salts have long been advocated. Burgess, in 1928, showed that it was only the cases with dermatography that were thus improved. In *hay fever* and *asthma* their benefit is very doubtful. Calcium salts, as usually given, do not increase the coagulability of the blood. The benefit of treating *chronic ulceration* by calcium and dried parathyroid extract, as advocated by Grove and Vines, has not been confirmed.

This review by Donald Hunter is so comprehensive that only a few other papers call for notice.

A. J. Quick and A. Hunsburger<sup>3</sup> describe an advanced case of *generalized osteitis fibrosa*, illustrating the vital importance of early diagnosis. A young man, who at the age of 21 was exceptionally well developed, was reduced in

the course of three years to the state of a helpless cripple. His blood calcium, which was 15.4 mgrm. when he first came under observation, fell to 8.9 mgrm. after operation for removal of the parathyroid tumour, and then as low as 5.6 mgrm., with marked signs of tetany. After the intravenous injection of 1 gm. **Calcium Chloride** there was marked improvement in this respect. The authors advocate a preparation of vitamin D, **Viosterol**, for preventing or minimizing parathyroid tetany and also for hastening the recalcification of bone after the removal of a parathyroid tumour.

L. Gunter and D. M. Greenberg<sup>4</sup> point out that it is not the total amount of calcium in the serum which is a guide in *parathyroid tetany*, but the amount of diffusible calcium. When this falls to 3.5 mgrm. per cent or less, active tetany supervenes. Tetany due to a shift in the alkaline direction in the blood, e.g., due to hyperventilation or an overdosage of bicarbonate, shows no decrease in the diffusible calcium, and is therefore of a different type.

J. C. Meakins<sup>5</sup> gives a table of the *mineral and bony changes* in some of the diseases here referred to, which may be of service.

NO.	DISEASE	BLOOD CALCIUM	BLOOD PHOSPHORUS	CALCIUM BALANCE	BONY CHANGES
1	'Parathyroid tetany' ..	Low	Normal or increased	Positive	None
2	Nephrosis .. .. .	Low	Normal	Positive	None
3	Steatorrhea with megacolon (sprue, cœliac disease) .. .. .	Low	Normal	?	None
4	Rickets—infantile ..	Low usually	Low sometimes	Relatively negative	Present
5	Osteomalacia .. ..	Decreased, normal, or increased	Variable	Negative	Present
6	Generalized osteitis fibrosa	High	Low	Negative	Present

J. de J. Pemberton and K. B. Geddie<sup>6</sup> report a case in a girl of 14 of *parathyroid adenoma* leading to all the recognized symptoms—progressive weakness and loss of muscular tonus, attacks of abdominal pain and vomiting, anemia, polydipsia, hypercalcemia and hypophosphatemia, and diffuse decalcification of the skeleton. The removal of the parathyroid tumour was followed by marked relief from all these symptoms. Unlike most of the previously reported cases, tetany did not supervene, though tingling and numbness occurred which was relieved by intravenous injections of 5 c.c. of 10 per cent solution of **Calcium Chloride** on one occasion, and 10 units of **Collip's Parathormone** on another. They agree with Albright and Ellsworth that the first metabolic disturbance initiated by excess of parathyroid activity is an increased excretion of phosphorus which causes the blood to lack calcium phosphate, which is met by a mobilization of calcium from the bones. The polyuria is associated with a more or less fixed specific gravity, indicating some disturbance of water balance, but no explanation of its mechanism has been advanced. It usually clears up quickly after the removal of the tumour.

I. Snapper<sup>7</sup> reports the successful removal of a parathyroid adenoma from a man aged 56 who suffered from marked softening of the bones as a result of generalized osteitis fibrosa. In this instance the blood calcium was as high as 23 mgrm. per 100 c.c. on one occasion; so that it is not surprising that he suffered severely from tetany after operation, which required treatment by calcium salts intravenously, and parathormone subcutaneously.

F. S. Hansman<sup>8</sup> reports cases of symptoms of *parathyroid defect coming on after thyroidectomy or excessive radiotherapy to the thyroid gland* which were relieved completely on the administration of relatively large doses of **Irradiated Ergosterol** (usually in the form of 15 min. of radiostol three times a day).

REFERENCES.—<sup>1</sup>*Quart. Jour. Med.* 1931, April, 393; <sup>2</sup>*Jour. Clin. Invest.* 1930, ix, 143; <sup>3</sup>*Jour. Amer. Med. Assoc.* 1931, March 7, 745; <sup>4</sup>*Arch. of Internal Med.* 1931, April, 680; <sup>5</sup>*Canad. Med. Assoc. Jour.* 1931, May, 654; <sup>6</sup>*Ann. of Surg.* 1930, 202; <sup>7</sup>*Arch. of Internal Med.* 1930, Sept., 506; <sup>8</sup>*Med. Jour. of Australia*, 1930, Dec., 809.

### PARATYPHOID FEVERS. (See also PYREXIA, CONTINUED; TYPHOID FEVER.)

J. D. Rolleston, M.D., F.R.C.P.

SYMPTOMS AND COMPLICATIONS.—R. M. Williams<sup>1</sup> records two fatal cases of *hæmorrhagic paratyphoid B fever* in brothers aged 11 and 13. Both developed hæmorrhages into the skin of the thorax and abdomen at the same time, and one had intestinal hæmorrhage. The blood-platelets were normal in amount.

R. Damade and F. Papin,<sup>2</sup> who record a personal case, state that comparatively few examples of *intestinal perforation* in paratyphoid B fever have been reported. The prognosis appears to be less unfavourable than in typhoid fever, as of 9 cases published by Cornil, 5 recovered after operation, and of Latouche's 9 cases operated on, 3 recovered, while 6 on whom no operation was performed died. The writer's case was that of a girl aged 17 who perforated in the second week of paratyphoid B, which until then had been diagnosed as influenza. Operation was performed and recovery was uneventful.

B. Edinger<sup>3</sup> reports two cases of paratyphoid B in men aged 32 and 25 respectively, complicated by *pleurisy with effusion* from which *B. paratyphosus B* was cultivated as well as from the *sputum* in both patients. The disease ran a relatively mild course, and recovery took place in both cases.

According to J. M. Fricker,<sup>4</sup> paratyphoid C often presents the clinical appearance of typhoid fever of moderate severity. There may also be either abortive forms simulating a mild gastric disturbance or very severe and fatal attacks. *B. paratyphosus C* even more frequently than *B. typhosus* may give rise to a variety of different affections, such as endocarditis, osteitis, and cutaneous abscesses. A septicæmic form of paratyphoid C has also been described.

REFERENCES.—<sup>1</sup>*Brit. Med. Jour.* 1931, 1, 1067; <sup>2</sup>*Gaz. hebdom. des Sci. méd. de Bordeaux*, 1931, 35; <sup>3</sup>*Med. Kliník*, 1931, 352; <sup>4</sup>*Arch. de Méd. et de Pharm. milit.* 1931, 201.

### PARKINSONISM, POST-ENCEPHALITIC. (See ENCEPHALITIS, EPIDEMIC.)

### PARKINSONISM, POST-TRAUMATIC.

Macdonald Critchley, M.D., F.R.C.P.

The modern conception of Parkinsonism is that of a syndrome which may develop under numerous etiological circumstances. One now recognizes syphilis, arteriosclerosis, intoxication, epidemic encephalitis, tumour, epilepsy, and numerous psychoses among the possible causes of a Parkinsonian syndrome. Evidence has been accumulating during the past few years that points to the existence of cranial trauma as the origin of some cases of this syndrome.

In the earlier literature on paralysis agitans, there is a brief mention of injury as a possible etiological factor in some instances, but the trauma in such was sustained peripherally and did not concern the head. Mendel<sup>1</sup> in 1911 dealt with injury as a possible predisposing factor in the development of paralysis agitans, and quoted twelve cases in illustration. Paulian<sup>2</sup> in 1922 was the first definitely to admit a possible causality between head injury and the subsequent development of Parkinsonism. From that time, similar records



were made, and during the past nine years a not inconsiderable literature has accumulated, though almost exclusively from Continental sources. Among these records, one may enumerate the papers of Maier,<sup>3</sup> Guillaud,<sup>4</sup> Henssge,<sup>5</sup> Barkman,<sup>6</sup> Lotmar,<sup>7</sup> Richon and Girard,<sup>8</sup> Kluge,<sup>9</sup> Faure-Beaulieu and Desbuquois,<sup>10</sup> Grossoni,<sup>11</sup> Melkersson,<sup>12</sup> Benedek,<sup>13</sup> Bianchi,<sup>14</sup> Negro,<sup>15</sup> Pommé and Liégeois,<sup>16</sup> Eliasberg and Jankau,<sup>17</sup> Crouzon published records of personal cases in collaboration with his pupils,<sup>18, 19</sup> and in 1929 ably reviewed the situation in a paper written in association with Justin-Besançon.<sup>20</sup>

In these no common factor is traceable with regard to the nature or direction of the cranial injury, although Maier emphasizes the importance of the blow being directed horizontally, parallel with the base of the skull. One of Lotmar's patients sustained two head injuries; after the first one, Parkinsonism supervened, which became exaggerated after the second injury. The interval between the trauma and the appearance of the first clinical signs is variable. It has been as short as four hours in a case of Paulian's, and as long as eighteen months in one patient described by Lotmar. Often the period is merely one of days.

All the characteristic signs of Parkinsonism may be demonstrable; rigidity is constantly present, but tremor may be entirely absent or confined to one segment of the body. An additional clinical feature, foreign to the typical Parkinsonian syndrome, has at times been described in spontaneous pains of thalamic type, which may be accompanied by objective changes in sensibility. Psychological symptoms are not frequent, though a few writers have noted the existence of confusional or demential states.

In the great majority of cases on record, the study has been purely clinical and proof has been lacking of an unequivocal association between trauma and the extrapyramidal symptoms. It has been suggested that the anatomical relationship of the caudatum and thalamus to the ventricles renders the basal ganglia peculiarly susceptible to the effects of injury. Others have suggested changes in the blood-vessels of the corpus striatum as constituting a site of vulnerability for subsequent traumata.

The best pathological evidence of the existence of a Parkinsonian syndrome of traumatic origin rests in a case recorded by Paulian.<sup>21</sup> His patient was shot in the left temporal region in September, 1921. Signs of Parkinsonism supervened and progressed to the extent that, six months later, surgical intervention was undertaken. Operation proved fatal and opportunity was given for complete study of the brain. It was found that the bullet had entered the internal orbital gyrus and had emerged from the posterior part of the same convolution. Serial sections of the brain, taken in a vertical direction, showed necrosis around the bullet-track, and in addition hæmorrhages in the thalamus, in the infero-external part of the lenticular nucleus, and in the sub-thalamic region.

The case for the existence of a post-traumatic type of Parkinsonism is a strong one, though further pathological evidence is required before proof is established. Highly important medico-legal issues would be concerned, and the significance of this admission in industrial accidents can readily be imagined. In view of the frequency of post-encephalitic syndromes, even in the absence of a history of an acute illness, it follows that confusion in differential diagnosis is probable. To establish clinically the diagnosis of traumatic Parkinsonism there should be demonstrated: (1) A definite history of a head injury of some severity; (2) An interval of time between the injury and the development of sequelæ which is neither too long nor too short. Negative criteria are highly important; there must be absolutely no history of febrile illness, with or without somnolence, delirium, or diplopia, in the years immediately

preceding the onset of signs. There must be a complete absence of all the 'ocular signs' which are typical of the post-encephalitic state. Lastly, the utmost care must be taken to ensure that no Parkinsonian signs or symptoms were in existence prior to the injury.

REFERENCES.—<sup>1</sup>*Die Paralysis Agitans*, 1911; <sup>2</sup>*Bull. Soc. méd. des Hôp. de Paris*, 1922, 648; <sup>3</sup>*Klin. Woch.* 1926, 1827; <sup>4</sup>*Etudes névrológicas*; <sup>5</sup>*Zeits. f. d. g. Neurol. u. Psychiat.* 1927, ex, 796; <sup>6</sup>*Acta med. Scand.* 1928, lxxviii, 63; <sup>7</sup>*Nervenarzt*, 1928, i, 6; <sup>8</sup>*Soc. de Méd. de Nancy*, 1928, March; <sup>9</sup>*Opera Collecta*, V. "Congr. internat. med. pro artificibus calamitate afflictis aegrotisque", 1929, 273; <sup>10</sup>*Soc. de Neurol.* 1928, July 5; <sup>11</sup>*Cervello*, 1930, ix, 85; <sup>12</sup>*Hygieia*, 1930, xcii, 135; <sup>13</sup>*Gyógyászat*, 1930, i, 161; <sup>14</sup>*Riv. sperim. de Fren.* 1931, iv, 513; <sup>15</sup>*Minerva Med.* 1931, i, 279; <sup>16</sup>*Rev. neurol.* 1931, xxxviii (i), 224; <sup>17</sup>*Verhandl. d. Gesell. deut. Nervenarzt*, 1931, 399; <sup>18</sup>*Rev. neurol.* 1926, xxxiii (i); <sup>19</sup>*Ibid.* 1928, xxx (i); <sup>20</sup>*Presse méd.* 1929, Oct. 12, 1325; <sup>21</sup>*Sem. des Hôp. de Paris*, 1928, iv, 83.

**PARONYCHIA.** (See SKIN, FUNGUS AFFECTIONS OF.)

**PAROTIDITIS, POST-OPERATIVE.** (See POST-OPERATIVE COMPLICATIONS.)

### **PEMPHIGUS.**

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

S. Ayres, jun.,<sup>1</sup> has tested renal function in eight cases of pemphigus, using the excretion of phenolsulphonephthalein, injected intravenously and subcutaneously, as an index. All eight cases showed decreased excretion. The output was disproportionately lower when the drug was administered subcutaneously than when given intravenously. Other renal efficiency tests did not show such a regular disturbance: creatinin determinations were all within normal limits, non-protein nitrogen was abnormally high in three cases, the blood-sugar was elevated in two out of six cases tested. In three patients tested blood-chloride values were low. Ayres also lays considerable stress on the frequency with which septic foci are found either during life or at autopsy. He urges caution in the administration of arsenic in cases where excretion is affected.

REFERENCE.—<sup>1</sup>*Calif. and Western Med.* 1930, Aug., 556.

### **PENIS, CANCER OF.**

Sir John Thomson-Walker, F.R.C.S.

N. Bagnoli<sup>1</sup> reports 9 cases of epithelioma of the penis: 2 of the patients were between 30 and 40 years of age, 2 between 50 and 60, 3 between 60 and 70, and 2 between 70 and 80. Phimosis was found to be present in 3 of the cases, and in 3 there was a history of syphilis. In 44 per cent the site of the lesion was the prepuce, in 33 per cent the glans, and in 22 per cent the urethra. The tumour may begin as an ulceration or a small nodule resembling a wart, and may appear on any part of the organ. It may present a cauliflower appearance or develop in the form of a carcinomatous ulcer with infiltration of the base and edges. Treatment depends upon the nature and extent of the tumour and the patient's age and general condition. Superficial forms may be treated by radium or roentgen rays, but when ulceration or metastases are present the penis must be amputated and the glands removed. The author operated upon 7 of his 9 cases. Circumcision was performed in 1 case, amputation of the penis alone in 3 cases, and amputation of the penis and removal of the glands in 3 cases. In one of the cases which was not treated surgically, operation was contra-indicated by the poor general condition of the patient and the presence of pneumonia. In the other case the patient refused operation. There was 1 death among those operated upon, a mortality of 14.2 per cent. One of the patients treated surgically was found to be in excellent health when re-examined twenty months after the operation. The others were not seen again after their discharge from hospital.

A. C. Morson<sup>2</sup> reports 7 cases of cancer of the penis treated with **Radium** during the past five years at St. Peter's Hospital, London, and considers that such treatment of cancer of the penis offers a greater opportunity of cure than in the case of cancer in any other genito-urinary organ. His reasons for this statement are, that cancer of the penis is a local disease—lymphatic involvement is confined to the inguinal glands and never gives rise to general dissemination; that the condition is the most sensitive of the carcinomata to irradiation; that since it is a surface growth more than one application of radium can be given; and, finally, if radium fails, the disease can be cured by amputation. In 1 of the 7 cases, which was very septic, irradiation failed to produce any result, and eventually amputation was called for; in the remaining cases, the tumours disappeared, and the genital and urinary functions became normal. The writer describes his technique in detail, and he found that in the case of a malignant ulcer the base became the seat of apparently healthy granulation tissue in the course of from ten to twenty-one days, and normal squamous epithelium was seen to grow in from the edges. A striking fact, in all except the advanced cases, was the decrease in the size of the inguinal glands; in some cases they completely disappeared after recession of the primary lesion, indicating that such enlargement is due mainly to sepsis and not to malignant disease. Morson prefers, when removal of the inguinal glands is called for, to allow three months to elapse after removal of the penile growth. If at the end of three months the glands are still larger than normal and the skin over them is thickened, he regards these changes as being malignant and carries out a radical excision. By radium treatment of carcinoma of the penis the organ is preserved, and, though stricture of the external meatus may sometimes result, its frequency is not to be compared with that observed after amputation. If irradiation fails, it is still possible to fall back upon amputation with the knowledge that delay in surgical removal has not eliminated the hope of cure.

G. Ferry<sup>3</sup> reports a case of carcinoma of the penis in a man 78 years of age. There was a large ulcerated tumour the size of a tangerine orange involving the end of the penis with extension to the glands of each inguinal region. A mould covering two-thirds of the penis and containing 11 tubes of radium was applied for seventy-two hours, and five days later the patient was discharged from hospital. Four and a half years later the writer found on examination a healthy scar, absence of glandular enlargement, and no clinical evidence of recurrence. He states that in the East the incidence of this disease is much greater than in Europe, and considers that syphilis is an important factor in its causation. The lesion takes the form of an epithelioma, develops slowly, and seldom forms metastases. The choice of treatment is either amputation of the penis or radium therapy. The latter has the advantage of preventing mutilation and is often followed by excellent results. The mobility of the penis, however, makes the application of radium difficult, and irradiation may cause induration of the prepuce and corpora cavernosa, and sclerosis and atresia of the urethra. Extirpation of the inguinal glands is necessary when enlargement persists after treatment of the tumour.

REFERENCES.—<sup>1</sup>*Arch. Ital. di Urol.* 1930, vii, 221; <sup>2</sup>*Brit. Med. Jour.* 1930, ii, 953; <sup>3</sup>*Bull. et Mém. Soc. Nat. de Chir.* 1930, May 24, 618.

#### PERICARDIAL ADHESIONS.

A. Tudor Edwards, M.Ch., F.R.C.S.

H. Schloffer<sup>1</sup> records a collection of 36 patients suffering from gross pericardial thickening, which interfered with the cardiac action, who were submitted to **Pericardial Decortication**. This consisted in cutting a large window in the chest wall, displacement outwards of the pleura, and resection of the

thickened pericardium. The regions of the auricles and vena cava are the most dangerous.

Of these cases, 8 died during or soon after operation. Of those surviving, 4 died later of cardiac insufficiency, 1 of acute dilatation, 2 of the original disease (insufficient operative removal of the pericardium), and 1 of hepatic failure. Twenty patients were benefited, 1 for eleven years and 7 for more than one year. Schloffer reports one case with calcification of the pericardium in which decortication met with most satisfactory results. The patient, who previously had ascites and hydrothorax, could do light work after the operation.

REFERENCE.—*Med. Klin.* 1929, Nov. 15, 1777.

### PERICARDITIS, HÆMORRHAGIC.

A. G. Gibson, M.D., F.R.C.P.

In hæmorrhagic pericarditis it is not always easy to define whether the fluid withdrawn, especially by the xiphoid route, is pericardial or blood from the right ventricle. D. Simici, A. Craifaleanu, and M. Popescu<sup>1</sup> report a case and enumerate the differences between the two. The hæmorrhagic effusion tends to be of a darker colour from the presence of reduced hæmoglobin. It does not coagulate readily and may remain liquid for twenty-four hours. The number of red cells per cubic millimetre is very much below that in the blood, whereas the leucocytes are raised. The differential count shows a larger number of mononuclear cells. The hæmoglobin percentage is very considerably lowered in comparison with venous blood. Other chemical differences are also given between the two types of fluid.

REFERENCE.—*Presse méd.* 1930, April 15, 539.

### PERICARDITIS, TUBERCULOUS.

A. G. Gibson, M.D., F.R.C.P.

V. Audibert and J. Olmer<sup>1</sup> give some further clinical effects of tuberculous pericarditis which amplify those detailed in last year's MEDICAL ANNUAL (p. 351). The onset is insidious—no history of previous infective ailments; there is loss of appetite, vigour, and nutrition. Dyspnoea is gradual and increases. This is the most important of the early signs, and the others are increase of the cardiac area of dullness, fever, and general bodily deterioration. The dyspnoea becomes very insistent and difficult to control in the later stages. A further symptom is the extreme pallor of the face and the skin. The sensations of the patient are those of a painful resignation and a continual feeling of illness. The blood-pressure is invariably lowered. The cough is not marked, and expectoration is pale and in small quantities. Œdema is not constant, but the urine is early diminished in quantity. The liver is enlarged. Examination under X rays confirms the wide cardiac shadow which can be defined by percussion. The liquid withdrawn by pericardial puncture is a light greenish colour, often hæmorrhagic, and always hæmorrhagic microscopically. It is rich in albumin and lymphocytes and gives a positive Rivalta's test for exudates. The fluid is infective to a guinea-pig. Withdrawal of the fluid is the only means of allaying the dyspnoea, but the fluid accumulates rapidly and is always abundant. The authors have been able to withdraw up to a litre. The course of the disease rarely exceeds six or eight months, and is almost invariably fatal. The diagnosis is only likely to be confused with myocarditis, for the pericarditis which is subacute may not be perceived. When the patient with cardiac failure from myocarditis is put to bed, however, and treated by the ordinary methods, he improves, whereas those suffering from tuberculous pericarditis show no improvement with rest and treatment, but only on puncture of the pericardium. The mental anxiety of the pericardial patient remains where that of the myocardial patient tends to disappear. The appetite tends to improve in the one, but remains absent in the other.

REFERENCE.—*Presse méd.* 1930, Aug. 20, 1121.

**PERITONEUM, CANCER OF.**

A. Rendle Short, M.D., F.R.C.S.

J. Cottalorda and A. Caire,<sup>1</sup> of Marseilles, contribute an article on secondary cancer of the peritoneum. In women the ovary is generally the original site of the neoplasm, but when the patient comes under observation the peritoneum is full of plaques and nodules, and ascites is present. In men the stomach is usually the primary focus. The symptoms and physical signs are well known—ascites, tumours, and partial obstruction. The inguinal glands are sometimes enlarged, and cutaneous angiomata may appear. The onset of symptoms may be acute, simulating intestinal obstruction or torsion of an ovarian cyst, or insidious. It is worth while to explore the abdomen, because occasionally one has a happy surprise and finds something non-malignant. Two cases were greatly ameliorated by deep X-ray therapy.

REFERENCE.—<sup>1</sup>*Lyon chir.*, 1930, July-Aug., 401.

**PERITONITIS.**

A. Rendle Short, M.D., F.R.C.S.

W. Spitzer<sup>1</sup> reports on the use of intraperitoneal treatment with *B. coli* Serum in cases of late peritonitis. Fourteen cases are reported, mostly following appendicitis. About 75 c.c. of the serum was introduced. Only one died.

H. Kunz<sup>2</sup> reports on the use of sera in such cases. The Pasteur Institute recommends a mixed anti-serum as follows—anti-perfringens 40 c.c., anti-sporogenes 20 c.c., anti-œdematis (Novy) 20 c.c., anti-vibrio-septique 10 c.c., anti-histolyticus 10 c.c., in normal saline. Good results are claimed. At Graz, a mixture of anti-gas-gangrene and *B. coli* serum is given, 25 c.c. intravenously and 50 c.c. intramuscularly. The results are believed to be favourable.

**Bile Peritonitis.**—Many cases have been put on record of bile peritonitis without obvious perforation, even at autopsy. Some have concluded that the bile filtered through the intact wall of the gall-bladder, or ducts, or oozed from the surface of the liver; some believe that there was a minute perforation which healed and passed unnoticed. According to E. Bundschuh,<sup>3</sup> there is experimental and clinical evidence that if pancreatic juice gets access to the gall-bladder, its wall may become necrotic and pervious to bile. In Bundschuh's own case, the cystic duct was perforated, but at operation bile could not be pressed out of the gall-bladder into the peritoneal cavity, because the pressure forced a stone down into the cystic duct and occluded the hole.

REFERENCES.—<sup>1</sup>*Zentralb. f. Chir.* 1930, Dec., 3154; <sup>2</sup>*Ibid.* 2782; <sup>3</sup>*Arch. f. klen. Chir.*, 1930, clxi, 549.

**PERITONITIS, PNEUMOCOCCAL AND STREPTOCOCCAL.**

John Fraser, Ch.M., F.R.C.S.Ed.

J. H. Duncan<sup>1</sup> suggests that three avenues and modes of infection may be recognized: (1) Infections arising by way of the genital passages; (2) Infection which enters the peritoneal cavity through the wall of the small intestine at the level of the lower end of the ileum; and (3) General or septicæmic infection, which afterwards shows a peritonitis as a local evidence of the general disturbance. There is general agreement that the first is the most frequent method of infection, and that the high female incidence of the disease may be explained on this basis.

**CLINICAL.**—The syndrome of the clinical features is now well recognized. The picture is vividly presented by M. Guillemet<sup>2</sup>—the sudden onset of acute abdominal pain, at first localized to the peri-umbilical and the sub-umbilical areas; the rise of temperature to a high level (102°–104°); the evidently ill and somewhat drowsy child. At the end of a few hours there is often a phase of improvement, but this is a temporary development and by no means

constant. As the relapse develops there is vomiting and diarrhoea, the stools being light coloured and peculiarly fetid; there is often slight general cyanosis, and the tongue becomes dry, yet red and 'beefy' in appearance. All observers are agreed that, while the abdomen is tender to touch, there is not the same degree of muscular boarding as is encountered in the peritonitis following acute appendicitis.

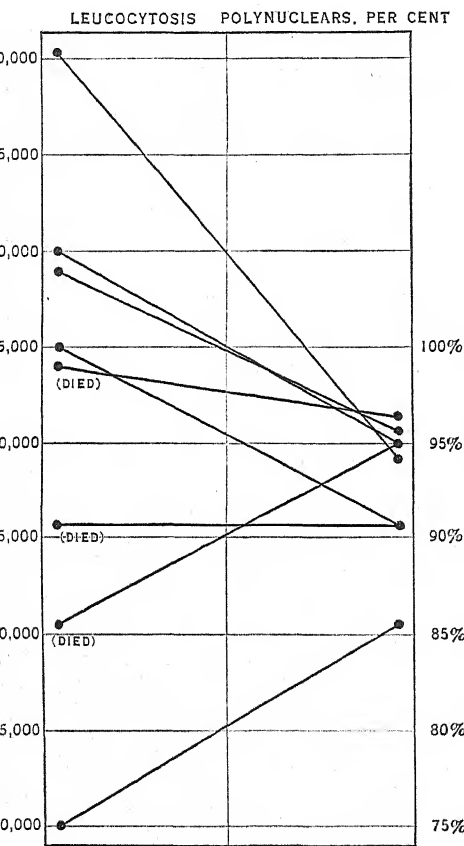
The clinical picture is of supreme significance, because it forms the basis upon which the diagnosis is usually made; of the various features in that

picture the diarrhoea and the indefinite character of the muscular rigidity are perhaps the most significant. Guillemin adds that, unfortunately, no feature of the group picture can be accepted as pathognomonic.

DIAGNOSIS.—One is naturally tempted to ask, "Are there any means by which an early diagnosis can be made?" The answer must be 'No', but it is true that certain aids are at our disposal by which we can obtain further helpful evidence.

C. L. Gibson<sup>3</sup> attaches much importance to the leucocyte count (*Fig. 78, 79*); he regards it as distinctive of pneumococcal peritonitis that there is an unusually high leucocyte count with a high percentage of polymorphonuclear cells. By contrast, the blood picture in a secondary appendicular peritonitis shows a moderate leucocytosis with a high polymorphonuclear count. In view of Gibson's observations M. Lafette<sup>4</sup> reviewed the blood picture of cases in Ombrédanne's clinic, and it would seem that the findings are not sufficiently constant to justify the acceptance of Gibson's rule as pathognomonic.

H. Kirchhoff<sup>5</sup> recommends that a bacteriological examina-



*Fig. 78.*—Chart of the leucocyte count in pneumococcal peritonitis (8 cases).

tion be made of the vaginal secretions. He regards a positive finding as being a most important link in the chain of diagnostic evidence, but he adds that the findings are not sufficiently constant to render the procedure a valuable one.

Abdominal puncture is the most conclusive means of investigation; its value is urged by Kirchhoff,<sup>5</sup> G. Wolfsohn,<sup>10</sup> and Duncan<sup>1</sup>; B. Lipshutz and H. Lowenburg<sup>6</sup> have employed it in all their cases. On the other hand, P. Matthieu<sup>7</sup> regards the procedure as somewhat dangerous, but there would not

appear to be any strong reason for his objection, and the method is undoubtedly of value. The puncture is made on the left side immediately medial to the anterior superior spine, or it is done, as Duncan suggests, by holding the child face downwards and inserting the needle in the middle line midway between umbilicus and pubis. A single drop of the abdominal fluid affords sufficient material for the investigation, and in a positive case the examination should afford confirmatory results.

The crux of the problem is to distinguish the pneumococcal or streptococcal infection from that which arises secondary to appendicitis, and, as the modern tendency is to adopt different types of treatment in these two classes of disease, it is evident how heavy is the responsibility in considering the problem of diagnosis.

**TREATMENT.**—The question of treatment may be said to resolve itself into this—that all who have been entrusted with cases of pneumococcal peritonitis have experienced a disconcerting mortality when the disease is operated on in the early and diffuse condition. On the other hand, the late operation, when the infection is partially or completely encysted, affords comparatively good results. There is a growing conviction that operation in the early stages is a mistake, that it aggravates the septicæmia, encourages the development of secondary deposits of infection, and lowers the vitality of the patient at a time when the maximum of resistance is required.

With one exception, the recorders of the past year have favoured this view. They have recognized the difficulty of excluding a secondary appendicular infection, and, when there is any doubt on the matter, all are agreed that exploration of the right iliac fossa is demanded. W. Obdalek<sup>8</sup> continues to favour early operation; he does so because of the difficulty in diagnosis, the uncertainty of the walling-off of the infective process, and the frequency with which relapse appears if delay is favoured. The almost universal recommendation to postpone operation in the early diffuse type of pneumococcal peritonitis has been the natural outcome of dissatisfaction with the mortality figures of the early operation, and the observation that cases which come under surgical care in the later stages of the disease yield moderately good results.

I would summarize the considered opinion of to-day as follows: In the early stages of the disease, while the infection is acute and diffuse and the diagnosis is confirmed, it is wise to delay operation and to adopt a conservative scheme

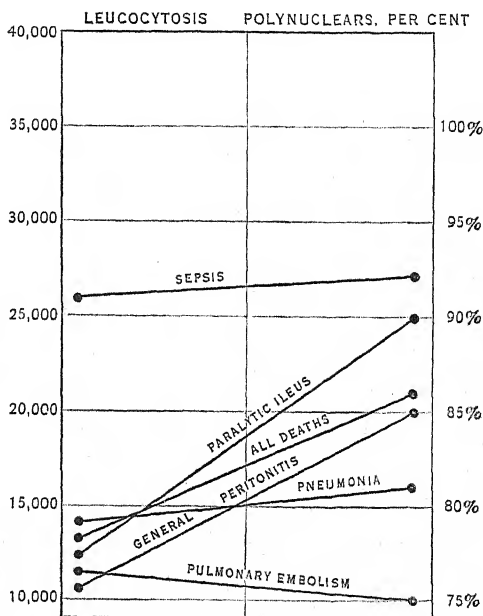


Fig. 79.

Fig. 79.—Chart of the leucocyte count in non-pneumococcal peritonitis (5 cases).

(Figs. 78 and 79 by kind permission of the 'American Journal of the Medical Sciences'.)

of treatment. If the diagnosis is uncertain, and there is a suspicion that the infection is appendicular in source, exploration of the right iliac fossa should be carried out. When the disease is localized and encysted, so that the condition has virtually become an abdominal abscess, incision and drainage are required.

If we accept these tenets, what are the details of conservatism? These are fully considered by H. Schaudig,<sup>9</sup> and they are referred to by authors already quoted. The procedure entails the administration of fluids, preferably intravenous saline (**Locke's Solution**), in a proportion of 35 c.c. per one pound of body weight in twenty-four hours, and the giving of large amounts (100 to 200 c.c.) of **Serum** intravenously for three or four days. The Type I serum may be used until the pneumococcus has been grouped, after which the appropriate type serum should be employed. Duncan<sup>1</sup> suggests that Falton's concentrated serum, prepared by the Connaught Laboratories, yields good results; in cases of streptococcal infection he advocates scarlet-fever antitoxin.

Schaudig's paper contains a number of suggestions designed to treat complications and to hasten localization of the infection. These include **X-ray** and **Radiant Heat** applications to the abdominal area, **Luminal-sodium Suppositories** to arrest the vomiting, and **Bismuth Salicylate** and **Tannalin** to allay the diarrhoea. Under the heading of **Dietary** he recommends almond whey emulsion, grape sugar, and fine maize flour. Where drugs are concerned, Schaudig advises the use of **Optochin** (crethyl-hydro-cuprein).

One cannot fail to be impressed by the increasing trend of opinion towards conservatism in the early stages of the disease, for it would seem to be accepted that inappropriate interference is harmful, and that it is wiser to trust to the natural resistive forces, improving these by such means as are possible.

The contrast from the point of view of mortality figures between two series of cases illustrative of the early operation and the delayed operation is summarized by G. Wolfsohn.<sup>10</sup> His figures indicate that the changed conception of treatment has resulted in a considerable reduction in the death-rate.

REFERENCES.—<sup>1</sup>*Canad. Med. Assoc. Jour.* 1931, June, 778; <sup>2</sup>*Lyon chir.* 1931, July, 485; <sup>3</sup>*Amer. Jour. Med. Sci.* 1930, Sept., 344; <sup>4</sup>*Bull. et Mém. Soc. de Chir.* 1931, June 13, 835; <sup>5</sup>*Zentralb. f. Chir.* 1930, Aug. 30, 2161-76; <sup>6</sup>*Jour. Amer. Med. Assoc.* 1926, Jan. 9, 99; <sup>7</sup>*Irish Jour. Med. Sci.* 1926, 623; <sup>8</sup>*Deut. Zeits. f. Chir.* 1929, ccxx, 307; <sup>9</sup>*Ibid.* 1930, Nov. 30, 295; <sup>10</sup>*Zentralb. f. Chir.* 1930, No. 46, 2842.

**PERTUSSIS.** (See WHOOPING-COUGH.)

**PETROL FUMES, POISONING BY.** (See CARBON MONOXIDE POISONING.)

## PHARMACOLOGY AND THERAPEUTICS.

Francis R. Fraser, M.D., F.R.C.P.

### Carbon Dioxide.—

*Control of Hiccup* (L. A. Golden<sup>1</sup>).—Carbon dioxide has been shown to stop hiccup by its action on the respiratory centre. The author found it efficacious in a few minutes, in six cases, by holding a paper bag over the mouth and nose and causing the patient to breathe into the bag.

### Oxygen.—

*Administration in Private Practice* (W. E. Waller<sup>2</sup>).—In private practice oxygen can be efficiently administered by causing it to bubble through a bottle at a rate of eight to twelve bubbles per second and leading it to a cone made of paper, placed closely over the patient's face.

### Artificial Respiration.—

*The Drinker Respirator* (P. Drinker, T. J. Shaughnessy, and D. P. Murphy<sup>3</sup>).—The Drinker respirator consists of a sheet-metal tank. The patient's head



protrudes through a flat soft rubber collar, making an air-tight seal. The air pressure is changed alternately, by means of electrically driven blowers, from a small negative pressure to normal atmospheric pressure. It has been found to be efficacious in respiratory failure due to acute poliomyelitis, carbon-monoxide poisoning, alcoholic coma, drowning, post-diphtheritic paralysis, and asphyxia of the newborn. Seventy machines for adults, and twelve of a size suitable for infants, are in use in America. In this country the manufacturing details have been entrusted to Messrs. Siebe, Gorman and Co.

#### Iron.—

*Value in Anæmic* (L. J. Witts<sup>1</sup>).—Witts finds that iron is effective in chlorosis and in the chronic microcytic anæmias of later life, and, though probably also in anæmia due to hæmorrhage, infection, and cachexia, it is difficult in these conditions to control other factors and prove the efficacy of iron. Ferrous salts are more efficacious than ferric, and the minimum effective daily doses of the different preparations are: Reduced iron 25 gr. (1.5 to 3.0 grm.); Bland's pill 30 gr. (2.0 to 3.0 grm.); ferrous chloride 4 gr. (0.25 grm.); iron and ammonium citrate 60 gr. (4.0 to 8.0 grm.). Much larger doses are without ill effect, but without marked advantage. Intolerance is rare, and digestion improved. Recovery may take several months, and the improvement during the first month may be small. Liver has an adjuvant effect on the action of iron in anæmia secondary to hæmorrhage, but this is not the case in chlorosis, nor in the chronic microcytic anæmias. In cases of achlorhydria, hydrochloric acid promotes the absorption of small doses of iron, but with adequate doses of iron the effect of the acid is not appreciable. Iron should not be given by injection, owing to the long duration of treatment and the considerable difficulty of giving adequate doses by this route. (See also ANÆMIA, PERNICIOUS; ANÆMIA, SECONDARY.)

*Anæmia in Infants* (H. M. M. Mackay<sup>5</sup>).—The babies at welfare centres, whether sick babies or apparently well, have anæmia, and this responds well to iron and ammonium citrate; not only is the anæmia cured, but the treated babies gain weight better than controls, and, above all, are more free from infections. Almost all the infants show a temporary increase of hæmoglobin after the second or third month, so that care must be taken not to ascribe such increase to any therapeutic measure adopted. A healthy baby of four weeks and upwards can usually be trained to take  $4\frac{1}{2}$  gr. of iron and ammonium citrate daily, but the addition of this mixture to the feeds must be done gradually to avoid colic and diarrhœa.

*Administration* (V. E. Henderson and T. A. Sweet<sup>6</sup>).—Compound tincture of lavender and simple syrup are recommended as the best covers for iron and ammonium citrate in prescriptions.

#### Aconite.—

*Therapeutic Value* (H. F. v. Kress<sup>7</sup>).—Aconite deserves a more extensive use for relief of pain. Von Kress prefers a dialysate prepared from the extract of the root. This contains 0.1 mgrm. of aconitine in 4 drops. The dose is from 4 to 12 drops, with an average dose of 8 drops three times a day. Good results are claimed in neuralgias, myalgia, arthralgia, inflammatory conditions of the serous membrane, and in disorders of menstruation.

#### Expectorants.—

*Mixtures to depress Cough* (V. E. Henderson<sup>8</sup>).—When thick mucus lodges in the finer passages and causes coughing, or when it adheres to the vocal chords, the coughing, which is most marked in the morning, can be cured by a mixture taken on waking and containing iodides, which cause a thin watery secretion, and morphine, which depresses the coughing centre. The following prescriptions are recommended:—

R	Tr. Opii	℥ij	Syrupi	℥xv
	Sodii Iodidi	gr. iij	Aquam	ad 5j
	Extr. Glycyrrhizæ Liq.	℥x		
R	Tr. Camphoræ Co.	℥xv	Syr. Sarsaparillæ (U.S.P.)	℥xv
	Sodii Iodidi	gr. iij	Aquam	ad 5j
R	Codeinæ Phosphatis	gr. $\frac{1}{2}$	Elixir Aromatici	5j
	Sodii Iodidi	gr. iij	(Canadian Formulary).	
	Syr. Sarsaparillæ Co. (U.S.P.)	℥xv		

*The Flavouring of Expectorant Mixtures* (J. F. Johnstone<sup>9</sup>).—True expectorants act reflexly through the stomach. The most efficient are ipecacuanha, antimony, and especially ammonium carbonate. These substances are difficult to cover by flavouring agents. The following prescription was found to be satisfactory after numerous experiments :—

R	Ammonii Carbonatis	gr. iij	Syrupi Tolutani	℥xv
	Vini Ipecacuanhæ	℥x	Aquam	ad 5j

#### Bitters.—

*Administration* (V. E. Henderson<sup>10</sup>).—Bitters are given before meals to cause a flow of gastric juice and to excite the appetite, and should contain alcohol, which undoubtedly leads to a flow of gastric juice. The following combination is recommended, and should be diluted four times :—

R	Tincturæ Nucis Vomizæ	℥v	Elixir Aromaticum	ad 5j
	Spiritus Chloroformi	℥xv		

#### Ammonium Nitrate.—

*Diuretic Action* (N. M. Keith, M. Whelan, and E. G. Bannick<sup>11</sup>).—Ammonium nitrate is an efficient diuretic, both in normal subjects and in patients with cedema. The site of action is not definitely known. It acts mainly on the kidneys, causing excretion of water and salts, but possibly acts also on the tissues. This latter action is not due entirely to the increase in hydrogen-ion concentration. The dose used was 8 to 10 grm. a day. A pronounced increase in the diuretic effect of the organic mercury diuretics, such as merbaphen, was demonstrated.

#### Glucose.—

*Evidence of Non-absorbability per Rectum* (B. Smith<sup>12</sup>).—Evidence is given that little or no glucose is absorbed when solutions are administered by rectum. It is suggested that reflex stimulation resulting from the injection may lower the level of the blood-sugar.

#### Olive Oil.—

*Administration by Mouth* (M. Chiray<sup>13</sup>).—The use of olive oil by the mouth is advocated in gastric ulcers, and in dyspepsia with similar symptoms but without ulcer; also in various disorders of the gall-bladder, such as cholelithiasis, cholecystitis without stones, and atony of the gall-bladder. In all these conditions symptoms are relieved, but there is no justification for the belief that olive oil assists in the passage of gall-stones, although this result has occasionally been obtained. Olive oil is a cholagogue, it stimulates contraction of the gall-bladder, and diminishes the secretion of acid by the stomach. In dyspepsia associated with disorders of the gall-bladder it should be given in the morning before breakfast in doses of one to two tablespoonfuls with a little lemon-juice.

#### Intravenous Injections.—

*Influence of Velocity on the Response to Intravenous Injections* (S. Hirshfeld, H. T. Hyman, and J. J. Wanger<sup>14</sup>).—A form of shock is described that occurs within forty to sixty seconds following intravenous injections. This was

found to depend on the rapidity of the injection, and to be independent of bulk, concentration, and specificity of the injected material. The prominent symptoms are circulatory and respiratory; the blood-pressure falls and dyspnoea or apnoea occurs. The shock may be fatal. The primary disturbance was found to occur in the liver cells. The investigations were carried out on animals, but similar phenomena are observed in man, and the authors point out that this 'speed shock' must be considered before deductions can be drawn from experiments in which lowering of the blood-pressure is obtained following intravenous injections of specific substances. The importance of slow injection whenever therapeutic substances are being administered by the intravenous route is emphasized, and attention is drawn to the value of the intravenous drip. Details of the method for administering fluids by the intravenous drip are given in an article entitled "Studies of Velocity and the Response to Intravenous Injections", by H. T. Hyman and S. Hirshfeld.<sup>15</sup>

#### **Blood Transfusion.**—

*Value in Systemic Infections* (H. Bürkle-de la Camp<sup>16</sup>).—Good results are reported from the intravenous administration of normal blood in cases of empyema, septicæmia, pyæmia, and puerperal infections. Amounts of blood varying from 150 to 300 c.c. were found to be as efficacious as larger amounts.

#### **Vaccines.**—

*Prevention of Colds* (H. G. Murray<sup>17</sup>).—Using a stock catarrhal vaccine in an attempt to lower the amount of lost time among the employees of a big industrial concern, the author concluded that vaccination as a preventive for head colds is uncertain as to results, but that this treatment in industry is economically sound. From the reduction in the numbers of colds among those vaccinated for three successive years, he considers the method to be helpful in 50 per cent of the persons treated.

#### **Bacteriophage.**—

*Value in Infectious Diseases* (F. d'Herelle<sup>18</sup>).—Good results have been obtained by treatment with bacteriophages in bacillary dysentery, cholera, bubonic plague, staphylococcal and streptococcal septicæmia, and infections with *B. coli*. Disappointing results have also been obtained, but enough good results are reported to suggest that this method will obtain a wider application. For success the race of bacteriophage used must not only be one with a maximum potency against the pathogenic organism involved, but it must be a very powerful race. It must also be administered so that it can come quickly into contact within the body with the bacteria it is designed to destroy, and it must be recently isolated. Similar therapeutic results are reported by P. Hauduroy.<sup>19</sup>

#### **Massage.**—

*Use in Internal Medicine* (R. Pemberton<sup>20</sup>).—Massage is an important method of treatment in all kinds of rheumatoid conditions, in disturbances of the circulation, and in chronic diseases. It must be administered intelligently. The indications for its use in arthritis are: to improve or maintain adequate circulation and drainage in the neighbourhood of the joints involved; to improve or correct the faulty processes in the soft structures; and to compensate for lack of muscular activity. It can usually be preceded profitably by the application of heat. It can easily be overdone, and must never traumatize. In disturbances of the circulation massage can be used to influence the mechanics of the situation, just as rest or the exhibition of digitalis, but is no more specific than are these more orthodox methods. In chronic illness many of the benefits incidental to bodily activity are lost, and massage offers a partial substitute for such activity, but in elderly patients it must be used with great conservatism and be administered by persons of experience.

**Hypnotics.**—

*Efficiency of commonly used Drugs* (G. P. Grabfield<sup>21</sup>).—A rough index of the efficiency of hypnotics commonly used in one hospital was obtained by administering half the dose recommended in the United States Pharmacopœia or by the manufacturer, noting the number of doses required to produce a comfortable night's sleep, and dividing the number of patients tested by the number of doses required. The hypnotics tested were: codeine, chloral hydrate, butylchloral hydrate, chlorbutanol, barbital (veronal), amytal, phenobarbital (luminal), phanodorm, ypral, neonal, carbromal (adalín), bromural, and sabromin. An index of cost was also calculated, and it was concluded that chloral hydrate and barbital are the most effective and cheapest non-alkaloidal hypnotics available to-day, and that satisfactory results are obtained with much smaller doses than are customarily used. Doses of  $2\frac{1}{2}$  gr. (0.15 gm.) of either of these two substances gave satisfactory results.

**Opolen.**—

*A new Anti-arthritic and Analgesic Remedy* (O. Adler<sup>22</sup>).—This new preparation, opolen, is made by the Chemischen Fabrik Helfenberg, and is allied to cincophen or atophan. Good results are reported in gout, acute polyarthritis, chronic arthritis, arthritis deformans, muscular rheumatism, myalgia, neuralgia, migraine, etc. It is given in doses of 0.5 gm. ( $7\frac{1}{2}$  gr.), three or four times a day, but, as in the case of cincophen, must not be taken for more than a few days at a time, so as to avoid toxic phenomena.

**Magnesium Sulphate.**—

*Intraspinal Injections for Relief of Intolerable Pain* (A. Gordon<sup>23</sup>).—Good results are reported in 12 cases from the intraspinal injection of a 25 per cent solution of magnesium sulphate for the relief of intolerable pain: 4 were cases of tabes, 7 were cases of radiculitis, and 1 was a case of tumour of the spinal cord. Lumbar puncture was performed at the usual site, 5 c.c. of spinal fluid withdrawn, and from 2 to 4 c.c. of the solution of magnesium sulphate introduced through the same needle. The relief obtained may last for several weeks, but the injections may be repeated at weekly intervals, if necessary. The number of cases in which this treatment failed to give relief is not stated.

**Ergotamine.**—

*Effect on Basal Metabolism* (J. B. Youmans, W. H. Trimble, and H. Frank<sup>24</sup>).—Carefully controlled observations showed that 0.5 mgrm. of ergotamine tartrate subcutaneously was without significant effect on the basal metabolic rate and fasting blood-sugar level of normal human subjects. The pulse-rate was slowed, and the diastolic blood-pressure slightly raised. The administration of 1 mgrm. by the mouth, three times a day over a period of several days, failed to influence the basal metabolic rate. Similar effects were noted in patients with thyrotoxicosis, but the effects on the pulse-rate and blood-pressure were in general more marked than in the normal subjects. The authors suggest that in normal subjects under basal conditions parts of the sympathetic nervous system are inactive and therefore insusceptible to the action of ergotamine, and that under other conditions, or in diseased states, parts of this system may be too strongly stimulated to show the effects of inhibition produced by the small doses that can be given to human subjects. They maintain that the slowing of the heart-rate that appeared in their experiments is due to a stimulating or sensitizing action on the vagus.

**Digitalis and Ephedrine.**—

*Dangers of Combination* (C. A. Johnson and N. C. Gilbert<sup>25</sup>).—From experiments on unanesthetized dogs and from a few clinical observations, the conclusion is drawn that undesirable and even dangerous effects may occur when digitalis bodies and ephedrine are administered together. The authors advise

that when digitalis is being used in the treatment of cardiac conditions, ephedrine should not be used, or should be used with extreme caution.

#### Congo Red.—

*Hæmostatic Value* (T. Wedekind, J. Becker, and B. Weinert<sup>26</sup>).—The intravenous injection of 5 to 10 c.c. of a 1 per cent aqueous solution of Congo red was found to be efficient in checking hæmorrhage in cases of hæmoptysis in pulmonary tuberculosis and in bronchiectasis, of menorrhagia, of bleeding following the extraction of teeth, and in hæmorrhage in a few instances of other diseases. Examination of the blood showed that such injections were followed by an increase in the number of monocytes and platelets, a rise in the fibrinogen content, and a fall in the coagulation time. The case reports suggest that the effects are obtained in a few minutes.

#### Salyrgan.—

*Diuretic Efficacy* (R. Fleckseder<sup>27</sup>).—Salyrgan and ammonium chloride were found to be efficacious in promoting diuresis in two cases of ascites when administered by the mouth. In one case the ascites was associated with alcoholic cirrhosis of the liver, and in the other with general œdema and tricuspid insufficiency. The dose of ammonium chloride was 5 grm. a day, and was given alone for two days; on the third day, 1 or 2 c.c. of the 10 per cent solution of salyrgan was added, and continued daily, and after a few days this was increased to 3 to 5 c.c. Salyrgan was also efficacious when administered per rectum. Six c.c. of salyrgan solution was added to 20 c.c. of a 5 per cent solution of dextrose and 20 drops of tincture of opium, and given per rectum two hours after the rectum had been washed out. This was given once a week, but was more efficient if ammonium chloride had been given by the mouth for a few days previously.

REFERENCES.—<sup>1</sup>*New Eng. Jour. Med.* 1931, June 4, 1182; <sup>2</sup>*Lancet*, 1931, March 28, 701; <sup>3</sup>*Jour. Amer. Med. Assoc.* 1930, Oct. 25, 1249; *Lancet*, 1931, May 30, 1187; <sup>4</sup>*Proc. Roy. Soc. Med.* 1931, March, 543; <sup>5</sup>*Ibid.* 552; <sup>6</sup>*Canad. Med. Assoc. Jour.* 1930, Oct., 551; <sup>7</sup>*Munch. med. Woch.* 1930, Nov. 28, 2062; <sup>8</sup>*Canad. Med. Assoc. Jour.* 1930, Nov., 673; <sup>9</sup>*Ibid.* Sept., 412; <sup>10</sup>*Ibid.* Dec., 818; <sup>11</sup>*Arch. of Internal Med.* 1930, Nov., 797; <sup>12</sup>*Calif. and Western Med.* 1930, Dec., 887; <sup>13</sup>*Presse méd.* 1930, Nov. 1, 1481; <sup>14</sup>*Arch. of Internal Med.* 1931, Feb., 259; <sup>15</sup>*Jour. Amer. Med. Assoc.* 1931, April 11, 1221; <sup>16</sup>*Deut. Zeits. f. Chir.* 1931, April, 237; <sup>17</sup>*New Eng. Jour. Med.* 1930, Oct. 9, 727; <sup>18</sup>*Canad. Med. Assoc. Jour.* 1931, May, 619; <sup>19</sup>*Presse méd.* 1931, Feb. 4, 168; <sup>20</sup>*Jour. Amer. Med. Assoc.* 1931, May 23, 1777; <sup>21</sup>*Ibid.* May 30, 1865; <sup>22</sup>*Munch. med. Woch.* 1930, Aug. 22, 1445; <sup>23</sup>*Med. Jour. and Record*, 1931, April 15, 399; <sup>24</sup>*Arch. of Internal Med.* 1931, April, 612; <sup>25</sup>*Jour. Amer. Med. Assoc.* 1931, May 16, 1668; <sup>26</sup>*Munch. med. Woch.* 1930, Nov. 28, 2049; <sup>27</sup>*Wien. klin. Woch.* 1931, May 22, 672.

### PHARYNX, DISEASES OF.

A. J. M. Wright, M.B., F.R.C.S.

**New Growths.**—The difficulty of fixing *radium needles* in the pharynx is generally recognized. Often, shortly after insertion, it is found that one or more of the needles have come out, largely owing to the movements of the tongue and lips. To obviate this, various methods have been suggested, such as inserting the needles in pairs and tying them together, stitching each individual needle in place, and the gathering of the threads attached to the needles into a bundle and passing them through a rubber tube and strapping them to the cheek. J. E. G. McGibbon<sup>1</sup> has elaborated an ingenious method by which the threads from the needles are passed through the nostrils and tied across the front of the nose, thereby pulling them up out of the way and obviating displacement by the pharyngeal and tongue movements. The method is carried out as follows: The needles are inserted in the tissues around the growth in the usual manner, each thread being left hanging out of the mouth in the grip of a pair of forceps. When all the needles have been inserted, a soft rubber catheter is passed along the floor of the nose on one side and its

end seized in the pharynx and brought out of the mouth. Half the total number of threads are then tied to the end of the catheter and drawn out of the nose (*Fig. 80*). This manœuvre is repeated on the opposite side, and the two bundles are finally tied together across the columella (*Fig. 81*). The author claims that by this method the great majority of the needles will remain in place over the necessary eight or nine days, and should one or two of them come out, they will remain safely suspended at the back of the pharynx. (*See also RADIUM TREATMENT OF CANCER.*)

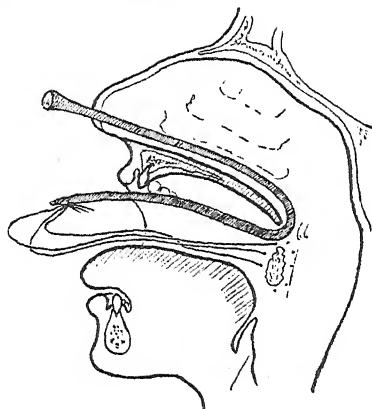


Fig. 80.

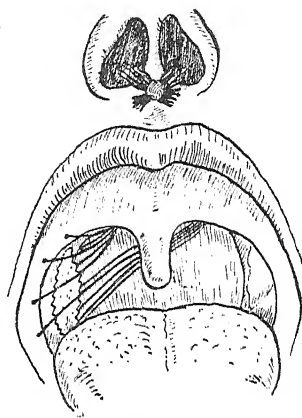


Fig. 81.

*Figs. 80 and 81.*—Method of anchoring radium needles by withdrawing the threads through the nose and tying them outside the nostrils. (*By kind permission of the 'British Medical Journal'.*)

**Agranulocytotic Angina.**—Owing to its severity, this complaint, though uncommon, is of some importance. H. Horn<sup>2</sup> describes it as a disease in which gangrenous ulcers appear on mucous membranes, usually in the mouth. This ulceration is accompanied by a characteristic blood picture consisting of a leucopenia with a reduction in the number of granulocytes. It is not known whether the ulceration represents the primary infecting focus or whether it is merely the product of lowered resistance. In any case, the leucopoietic apparatus in the bone-marrow seems to suffer. The course is like that of a severe infection, rapid and usually fatal, but the disease is not contagious. Repeated **Blood Transfusions** seem to be the only treatment which has met with any success. N. Rosenthal<sup>3</sup> bases a report on fifteen cases with a mortality of 60 per cent. In his opinion the leucopenia is the primary condition, the septic infection being a secondary result owing to the absence of resistance. Hypoplasia of the bone-marrow may be transitory, or it may possibly be the result of a permanent constitutional disturbance. Recovery, when it occurs, is usually spontaneous, following the re-establishment of the bone-marrow function. He does not regard any treatment as specific. (*See also AGRANULOCYTOSIS.*)

REFERENCES.—<sup>1</sup>*Brit. Med. Jour.* 1931, i, 843; <sup>2</sup>*Laryngoscope*, 1930, Dec., 910; <sup>3</sup>*Ibid.* 1930, 592.

## PHIMOSIS.

John Fraser, Ch.M., F.R.C.S.Ed.

No doubt countless children have been circumcised who need never have been, but the operation is definitely indicated under certain circumstances, and no substitute serves quite the same end. Even in the newborn it must

still be considered the operation of choice when retraction of the foreskin is impossible. A. E. Sawday,<sup>1</sup> however, advocates preputial stretching by artery forceps, and holds that circumcision is never necessary as a primary procedure, and rarely necessary at all. He is supported in this view by Westhuizen<sup>2</sup> and Spencer.<sup>3</sup> The adherent prepuce is first separated from the glans by a blunt probe. A pair of artery forceps is next insinuated into the resulting space, and the blades of the forceps are forcibly separated. Sawday issues a warning against over-violence, and urges that care should be taken not to split the prepuce; but it is hard to see how this can possibly be avoided if such a degree of narrowing exists as to demand treatment in the newborn. If the prepuce *can* be sufficiently dilated by this method without injury, it can hardly be said to have been sufficiently phimosed (and one must be careful to distinguish between an actual phimosis and the long and 'apparently' narrow foreskin of normal babies) to demand what would therefore appear to be an undesirable and unnecessary manoeuvre.

REFERENCES.—<sup>1</sup>*Brit. Med. Jour.* 1931, ii, 14; <sup>2</sup>*Jour. Med. Assoc. S. Africa*, 1930, Sept. 27, 571; <sup>3</sup>*Ibid.* 1930, Oct. 25, 640.

#### PILES. (See HÆMORRHOIDS.)

#### PINK DISEASE.

Reginald Miller, M.D., F.R.C.P.

G. M. Findlay and R. O. Stern<sup>1</sup> were able to produce a syndrome in young rats resembling pink disease clinically and anatomically by the administration of a special diet, and further they were able to cure the condition thus induced by the addition of raw liver to the diet. W. G. Wyllie,<sup>2</sup> acting on this plan, has found that pink disease in children responded quickly and satisfactorily to **Liver Treatment**. About 2 oz. of raw liver, mixed with milk and sugar, was the daily dose given, and a distinct improvement occurred within one or two weeks of starting the treatment. Five cases in all were treated, and there was no failure amongst them.

How far the success of this line of treatment has a bearing on the difficult subject of the pathogenesis of pink disease is doubtful. The two chief views held on this point are: (1) That the disease is due to an infective process with polyneuritis as a prominent sequel; and (2) That it originates from a lack of some vitamin. If the latter, it is seemingly true that the vitamin lacking is not one of the known vitamins: pink disease may arise where the diet shows no lack of known vitamins, nor is it cured by the administration of them. Wyllie sums up thus: "a dietetic factor contained in raw liver has a definite value in curing the disease. Of the nature of this factor, and whether a deficiency of it can cause the disease in the absence of a positive factor, possibly infective, we are not at present able to judge."

The same author gives a minute account of the pathological changes in the nervous system in fatal cases of pink disease. He found the evidence for a characteristic and pathognomonic lesion somewhat meagre, but in the majority of cases in which the peripheral nerves were examined evidence of some degenerative change in them was forthcoming. In all instances the clinical symptoms were much in excess of the pathological findings.

REFERENCES.—<sup>1</sup>*Arch. of Dis. Childh.* 1929, iv, 1; <sup>2</sup>*Ibid.* 1931, vi, 137.

#### PITUITARY GLAND.

W. Langdon Brown, M.D., F.R.C.P.

After the full review of pituitary diseases in the last volume of the *MEDICAL ANNUAL* (p. 357), there is little fresh to add at present. Two rare syndromes may be alluded to; Laurence Biedl has described a rare familial condition of *dystrophia adiposogenitalis*, with atypical retinitis pigmentosa and mental

deficiency, in which polydactylism may also occur. *Christian's disease* is a syndrome of diabetes insipidus, exophthalmos, and defects of the membrane bones, which is at times associated with dystrophia adiposogenitalis. L. Gaugier<sup>1</sup> attributes the maintenance of venous tone to the pituitary, and the occurrence of varicose veins to a disturbance of this function. In view of the close association between the pituitary and the emotional centres in the diencephalon, this would afford some explanation of the nervous factor in the production of varicose veins to which some writers have called attention.

A. Pozzi<sup>2</sup> reports a case of the adiposogenitalis syndrome in a man of 48 following a fracture of the sella turcica.

F. Roberts<sup>3</sup> records a case of *adenoma of the pituitary* producing hunger and great sleepiness, with failure of vision, which responded readily to X-ray treatment. C. H. Frazier<sup>4</sup> reports cases similar to Roberts's, and records a case of *progeria* (premature senility) in a boy of 15 due to a calcified cyst in the pharyngeal duct of the pituitary. He calls attention to the number of cases, especially in adolescents, where, in spite of unmistakable evidence of pituitary dysfunction, the sella turcica is not enlarged. This is particularly the group in which **Glandular Feeding** should be considered. He has no doubt that favourable results have followed this treatment, especially (as Gardiner Hill found) when combined with administration of **Thyroid**. He recommends 6 gr. of pituitary extract daily. He sums up methods of treatment thus: glandular feeding for pituitary dysfunction without pressure phenomena; radiation for primary pituitary lesions, particularly adenomata, with evidence of early pressure signs but without signs of advanced optic atrophy; and finally operative interference when vision is threatened or headache is intolerable.

E. P. Bugbee, A. E. Simond, and H. M. Grimes, in a paper read before the American Chemical Society on Sept. 10, 1930, observe that while eleven different functions have been ascribed to the anterior pituitary, they are not prepared to attribute each to a separate hormone, since ten of these activities appear to be due to substances of similar chemical characteristics. But the growth hormone is clearly separable from the others.

**The Pituitary Gland and Cancer.**—W. Susman<sup>5</sup> has aroused interest by his suggestion that the pituitary may play a part in the etiology of cancer. Zondek, in 1930, showed that in 15 per cent of 118 cases of new growth, the anterior pituitary hormone was present in the urine in sufficient quantity to give a positive Zondek-Aschheim reaction in mice. That this activity does not in itself cause cancer is evident from the fact that the reaction is positive in 98 per cent of healthy pregnant females. The association of an enlarged posterior lobe with renal infantilism, and Sharpey-Schäfer's observation that grafting of the posterior lobe into tadpoles retards growth, suggested that among the functions of this lobe is retardation of growth. Susman adopts Stewart's hypothesis put forward in 1921 that the different cells of the anterior lobe are merely in different stages of function and that the eosinophil cells contain the active secretion. But this is to ignore the later work of Evans and Simpson showing that the basophil cells are not concerned with growth, but with sex, and one would expect that it is these basophil cells which are responsible for the Zondek-Aschheim reaction, especially in view of its being positive in 98 per cent of healthy pregnant females. In other words, stimulation of growth and of sexual activity are due to entirely different hormones in the anterior pituitary. Moreover, an enlargement of the posterior pituitary is by no means an invariable accompaniment of renal infantilism.

In 14 cases of cancer apart from carcinoma of the pancreas Susman found the islet tissue was increased in 12, and he considered this pointed to an increased



demand for carbohydrate. He therefore proceeded to an experimental investigation as to whether tumour growth is influenced by the presence of abundant carbohydrate and whether pituitrin had any effect in checking the growth of epitheliomata in mice. He considered that his results enabled him to answer both these questions in the affirmative, and justified his applying the methods to clinical cases. In his first series the treatment simply consisted of a diet low in carbohydrates, and the injection of 0.5 to 2.0 c.c. of **Pituitrin** twice daily. He then added an **Ovarian Extract** on the view that the gonads had a restraining influence on the pituitary. Here, again, one feels that he is on rather unsafe theoretical ground. However, theoretical objections cannot weigh against practical results. In the first group all the patients died, although the growths showed regression. In the second group where the ovarian extract **Theelin**, 0.25 to 0.5 c.c. once daily, was added, the five patients showed no setbacks, and none of them had died at the time of writing. It should be noted that although the injections of pituitrin were not made into the growth, they were followed by intense pain in the tumour in three to ten minutes, lasting for about half an hour. This had to be controlled by morphine or its derivatives. When the output of urine fell below 20 oz., the dose of pituitrin was reduced and if necessary stopped.

REFERENCES.—<sup>1</sup>*Presse méd.*, 1931, Feb. 11, 206; <sup>2</sup>*Políclínico*, 1931, May 1, 213; <sup>3</sup>*Lancet*, 1931, i, 806; <sup>4</sup>*Surg. Gynecol. and Obst.*, 1931, June, 1069; <sup>5</sup>*Brit. Med. Jour.*, 1931, ii, 794.

## PLAGUE.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

EPIDEMIOLOGY.—Three further notes on rat-fleas and the transmission of plague are contributed by W. J. Webster and G. D. Chitre.<sup>1,2,3</sup> A flea survey in Bombay showed *X. cheopis* to be five to twelve times as numerous on *R. rattus* as *X. astia*, without any marked seasonal variations. *X. braziliensis* was found to be rare and nearly confined to the most rural area investigated. The *cheopis* index was highest in *R. rattus* and the *astia* one in *R. norvegicus* and in *Gunomys*. Tests made in Bombay showed that all three species of flea readily feed on man in the absence of a more suitable host, even at temperatures over 80° F., and no striking differences were found in the longevity of starved individuals. *Cheopis* thrives at all seasons, but the cold season is least favourable to *astia* and the hot one to *braziliensis*. From a study of the plague-transmitting powers of the three varieties of rat-fleas, the authors concluded that in Bombay the blocking phenomenon of the fleas with plague bacilli under the influence of climatic conditions is the chief factor in the spread of plague, so that, with the rather limited range of temperature and humidity during the epidemic season, a much larger proportion of infected fleas can transmit plague. The species factor is important, because a far higher *astia* index is required for the prevalence of plague than in the case of *cheopis* or *braziliensis*, thus confirming Hirst's theory.

REFERENCES.—<sup>1</sup>*Ind. Jour. Med. Research*, 1930, July, 337; <sup>2</sup>*Ibid.* Oct., 391; <sup>3</sup>*Ibid.* 407.

## PNEUMOCOCCAL PERITONITIS. (See PERITONITIS, PNEUMOCOCCAL AND STREPTOCOCCAL.)

## PNEUMONIA.

W. H. Wynn, M.D., F.R.C.P.

It is a matter of common observation that pneumonia has within recent years altered in type. The classical lobar pneumonia is not so often seen, and modified forms associated with mixed infections are prevalent. This change apparently has occurred since the great influenza epidemic of 1918-19. The recognition of this change is obviously important in connection with specific

prophylaxis and treatment. D. Ordman<sup>1</sup> emphasizes this point in an interesting study of the history of pneumonia on the Witwatersrand gold-fields during the last two decades. In the earlier part of this period a frank lobar pneumonia with the classical crisis in recovery was commonly seen. In the event of death supervening, the lungs showed the familiar consolidated lobes, and from the latter a pure culture of the pneumococcus was almost invariably isolated. This organism in some 70 per cent of cases belonged to Lister's groups 'A', 'B' or 'C'. Experimental prophylactic inoculation on a large scale with the pneumococci of the ascertained groups commenced in 1916, and in 1917 mass inoculation of nearly all the native mine workers was established as a routine. Following this prophylactic inoculation new groups of the pneumococcus appeared, while the original groups 'A', 'B,' and 'C' disappeared. Coincident with the eradication of the pneumococcal strains that were prevalent in the virgin uninoculated community, the incidence- and mortality-rates in lobar pneumonia showed a striking decrease. As time went on, the finding of new heterogeneous strains of the pneumococcus became increasingly common. It was necessary then from the point of view of prophylaxis to keep pace with the new infecting agents and incorporate them in the vaccine as far as possible. From 1927 onwards, however, the pneumococcal type of pneumonias became less common. Other organisms, *Streptococcus pyogenes*, *B. influenzae*, *Staphylococcus aureus*, etc., were found in addition to, or in place of, the pneumococcus. In view of this change in the bacterial flora it is not surprising that at the same time the efficiency of the prophylactic vaccine designed to protect against a pure pneumococcal infection was found to have diminished. From a clinical point of view certain changes also occurred. In a large proportion of patients diagnosed as suffering from lobar pneumonia various clinical differences were observed as compared with the old-time pneumonia. Generally speaking the disease appears to have the features of an influenzal modification. The respiratory distress is not so evident. The expected rusty sputum is frequently absent, and recovery tends to occur by lysis. The lungs post mortem are found to be less massive than the old type, while the unconsolidated portion of the lungs is very red and congested. It is instructive to note how the occurrence of this modified pneumonia, the loss of efficiency of the prophylactic vaccine, the increased incidence of pneumonia, and the change in the infecting bacteria coincide in point of time. Their epidemiological relationship is suggested, and it seems clear that the increased incidence of pneumonia in the last few years is due to the appearance of a modified form against which the vaccine could obviously have but little action. It was also found that the bacterial flora differed at different seasons and in different localities.

A. Abrahams<sup>2</sup> gives the results of a study of 558 cases of lobar pneumonia. Each patient was a soldier on active service and treated in a military hospital, so that the material was comparatively selected. Only two patients were over fifty years of age, and both died. Of the total series 61 (10.9 per cent) died. As an initial symptom a rigor was described in 70 per cent and pain in the side in 60 per cent. Headache and vomiting were fairly common, but abdominal pain of such severity as to suggest an acute abdominal lesion was described in only 5.5 per cent. Definite and unmistakable physical signs were present in the first twenty-four hours in only 2.15 per cent, though in nearly 80 per cent signs appeared within four days of the onset. Characteristic sputum was rarely evident on the first day, and its appearance was most usual on the second, third, and fourth days. As a contrast, however, 10.9 per cent had no sputum. More or less pyrexia at the outset was practically universal, but a very high temperature was regarded as being against a diagnosis of pneumonia. In only 3 was the temperature higher than 105°; over 70 per

cent were between  $101^{\circ}$  and  $104^{\circ}$ . In 80 per cent the pulse-respiration ratio was between 3:1 and 4.5:1. In view of the statement that the absence of knee-jerks is a feature of pneumonia, these were investigated in all cases. They were abolished in 24.7 per cent, feebly present in 12.4 per cent, normally present in 44.4 per cent, and exaggerated in 18.5 per cent. As regards differential diagnosis, it is suggested that any acute illness, and even constipation, especially in children, may be mistaken for pneumonia at its outset. Apical pneumonia is often anomalous in its manifestations, whilst the asthenic type, seen in the senile and alcoholic, is likely to be unfamiliar in its manifestations. A type calling for special consideration is the patient whose presenting symptom is severe abdominal pain. This was present in 31, and in 7 a diagnosis of appendicitis had been made. In 3 of these operation was undertaken without reference to a physician, and 3 others reached the theatre and underwent preparation for operation before a physician examined them. From these figures it would seem that the simulation of an acute abdomen is not so common as is sometimes suggested. Headache was in a limited number of cases of sufficient severity to justify a provisional diagnosis of meningitis. Pneumococcal meningitis, always fatal, occurred in 1 per cent; in 25 others meningeal symptoms occurred and lumbar puncture was performed and afforded immediate relief. Delirium was very prominent in 4 per cent, and 3 patients were actually admitted to the mental ward as acute mania. A crisis occurred in 56.5 per cent and most commonly on the seventh day. Lysis occurred in 15.6 per cent. Herpes labialis was seen in 17 per cent, and these had a mortality of only 4.2 per cent. Empyema occurred in 20.8 per cent, but of these 116 cases only 30 required resection, the remainder clearing up with aspiration. Of the 116 cases 23 died. Pericarditis occurred in 2 per cent of cases, with a mortality of 36 per cent.

W. L. Niles and J. Wyckoff<sup>3</sup> have made a controlled study of **Digitalis Therapy** in pneumonia. In 1927 a committee was formed to organize and study the effects of digitalis, and the observations were carried on continuously in 1928 and 1929. The patients studied were also being used for the study of the effects of serum, so that they were grouped into four classes. Class A received neither serum nor digitalis; Class B received serum only; Class C received digitalis only; Class D received both serum and digitalis. During the first year all cases of pneumonia were included, but in the second year those who gave a history of more than eight days' duration were excluded and also those with general systemic diseases. The control and treated patients were observed in exactly the same way. In addition to the usual clinical and laboratory examinations, an electrocardiogram was made daily during the febrile period and on alternate days thereafter. It was realized that in an acute disease such as pneumonia the patients should receive their digitalis rapidly, but that toxic effects should be prevented. It was given in divided doses, and no more than 0.15 of a cat unit per pound of body weight. During the first year the dose was divided into parts approximating to 30, 30, 15, 15, and 10 per cent at intervals of six hours. The weight of the patient was roughly estimated. In the second year the dosage was reduced to nearly one-half. Patients were divided into those above and those below 150 lb. The former received 12.5 cat units or 1.25 gm., and the latter 10 cat units or 1 gm. This was given in three doses, 50 per cent at the first dose, 25 per cent twelve to eighteen hours later, and the third dose of 25 per cent after six to eight hours. In both years a daily maintenance dose of 2 cat units was given as a single dose each morning, and discontinued when the temperature became normal or when toxic signs developed. *Table I* gives the results.

Table I.—COMPARATIVE MORTALITY OF DIGITALIS CONTROL AND TREATED CASES FOR THE FIRST AND SECOND YEARS.

YEAR	DIGITALIS CONTROL			DIGITALIS TREATED			DIFFERENCE
	No. of cases	No. died	Mortality per cent	No. of cases	No. died	Mortality per cent	
First .. ..	197	68	34.5	158	67	42.4	7.9
Second .. ..	207	68	32.9	180	73	40.6	7.7
First and second	404	136	33.7	338	140	41.4	7.7

This indicates that for every 100 cases in the control group that died there were 122 deaths in the digitalis-treated group. The mortality of the digitalis-treated group was higher in both the older and younger age groups. The mortality was also higher for all the pneumococcus types except for Type II in patients under 40 years of age. A surprising result was that with 23 cases with auricular fibrillation or flutter the mortality in those treated with digitalis was distinctly higher. The Committee came to the conclusion that whilst they would prefer to continue the investigation, and observe a larger number of cases, it was the unanimous opinion that the results obtained thus far do not justify continuing the routine administration of digitalis to patients suffering with lobar pneumonia.

Lord Dawson<sup>4</sup> suggests that cyanosis in pneumonia is in part due to such a damage of the alveolar endothelium by the pneumococci as to deteriorate its functional efficiency. In this way anoxæmia is linked with toxæmia. This close association explains why the alleviation of symptoms by **Oxygen Therapy** is sometimes partial and transient. Oxygen is a supportive rather than a curative measure. It may produce a marked improvement in the appearance and comfort of the patient, diminution of the pulse- and respiration-rates, and less restlessness. Methods of oxygen administration must be efficient, secure an adequate oxygen saturation of the blood, and not be distressful to the patient. For routine treatment the nasal catheter (No. 10) is the best. By using calibrated reducing valves the amount of oxygen delivered can be determined and regulated. If two litres per minute are delivered through the catheter, the inspired air contains 30 per cent of oxygen, and the latter can be raised to 35 per cent. Masks for oxygen administration are impracticable because they distress the patient. The use of the funnel and tube does not give inspired air a higher oxygen value than 22 per cent, and is of little use—just an imposing ritual. When the abdomen is distended and the bases of the lungs are apt to lose functional efficiency, the latter can be improved by a brief inhalation of oxygen mixed with 5 per cent carbon dioxide. Some patients who are fully conscious, besides being in bodily pain and distress, suffer anguish from thoughts of endangered employment, or families left unprovided for. Sometimes by the use of alcohol, at other times by hypnotics, at other times by one of the morphia family, ease can be secured. The hesitancy to use **Morphia** and its allies is fortunately passing. For pain and damping down cough it is essential. The cough which derives itself from a pneumonic area can do no good. The fear that morphia in medicinal doses will depress the respiratory centre is a bogey. On the other hand, the muscles of respiration become exhausted by their constant use in coughing. The only condition under which morphia may require to be withheld or used with great restraint is in a generalized bronchitis with an exudate blocking the tubes. When a patient is just restless and sleepless all will agree that a hypnotic is

better than morphia—very often a combination is good—just enough of nepenthe to reduce cough, and the hypnotic secures a good sleep. In acute infection **Chloral** and **Bromide** still hold an important place.

Since the introduction of **Felton's Serum** there has been a renewal of interest in the serum therapy of pneumonia. The original serum was only effective against Type I, the bulk to be injected was considerable, frequent repetition was required, and there was delay in typing the infection. These disadvantages have to some extent been overcome by the use of Felton's serum, which is polyvalent (Types I and II) and concentrated so that a dose of 5 c.c. contains 10,000 units. Lord Dawson holds that the time has come for a wider trial of this serum, as its administration can be commenced early and without waiting for the typing of the strain, since over half the cases are usually included in those due to Types I and II.

The effective dose of Felton's serum has been stated by various authors. R. L. Cecil and W. D. Sutliff<sup>5</sup> recommend 100,000 units during the first twenty-four hours of treatment. The serum contains about 2000 units against Type I and about 2000 units against Type II. (The unit is the amount necessary to protect a mouse against 0.05 c.c. of a 1-10 dilution of an eighteen-hour broth culture of pneumococci, which is usually equivalent to at least one million lethal doses.) W. D. Sutliff and M. Finland<sup>6</sup> vary the dose according to the stage of the disease, the smallest amount being given to patients treated within twenty-four hours of the onset. Their scheme of dosage is:—

*Table II.*—DOSAGE FOR FELTON'S SERUM.

DURATION OF DISEASE	C.C. OF SERUM		PROTECTIVE UNITS IN AVERAGE SAMPLE
	Individual doses	Total	
1 to 24 hours ..	5 25	30	90,000
24 to 48 hours ..	5 25 45	75	225,000
48 to 72 hours ..	5 25 45 45	120	360,000
72 hours or more ..	5 25 45 45 45	165	495,000

The individual doses were administered at intervals of two hours in order to give all the antibody deemed necessary in as short a time as possible.

Most of the results recorded in America have been with Type I cases, and the following table gives the mortality:—

*Table III.*—MORTALITY OF TYPE I LOBAR PNEUMONIA TREATED WITH FELTON'S SERUM COMPARED WITH THE MORTALITY OF SIMULTANEOUS CONTROLS WITHOUT SPECIFIC THERAPY.

	WITH SERUM			WITHOUT SERUM		
	Cases	Deaths		Cases	Deaths	
R. L. Cecil and N. Plummer <sup>7</sup> ..	239	No.	Per cent	234	No.	Per cent
Cases of less than 3 days' duration	103	48	20.1	97	73	31.2
W. H. Park, I. G. M. Bullowa and M. R. Rosenbluth <sup>8</sup> ..	58	12	11.7	26	26	26.8
Cases of less than 3 days' duration	20	13	22.0	54	19	35.0
M. Finland <sup>9</sup> ..	80	6	21.0	28	10	36.0
Cases of less than 3 days' duration	42	17	21.3	70	22	31.4
H. S. Baldwin <sup>10</sup> ..	19	4	9.5	16	6	37.5
		1	5.2	20	5	25.0

Baldwin also treated 35 cases of Type II with 9 deaths as compared with 29 controls with 15 deaths.

Experience in Great Britain with Felton's serum has been with small groups of cases only. A Report by the Physicians of the Royal Infirmary, Edinburgh,<sup>11</sup> deals with 29 cases of Type I: 12 treated with serum, and no deaths; and 17 not treated, with 5 deaths. There were 41 cases of Type II; 17 treated with serum, and 5 deaths; and 24 not treated, with 10 deaths. The two series, however, are not strictly comparable, since only the control group contained patients over 60, and other patients in this group were moribund on admission, or extremely ill. In the surviving patients, however, no less than half of the serum-treated patients ended critically on or before the fifth day, while of the controls only 19.2 per cent so ended. They conclude that serum treatment seems to lessen the severity of the disease and undoubtedly shortens the febrile period in a proportion of cases. Many cases appear to become less ill and more comfortable as a result of the injections. Anaphylactic phenomena were observed in two cases. J. Cowan, R. Cruickshank, D. P. Cuthbertson, J. Fleming, and A. W. Harrington,<sup>12</sup> at the Royal Infirmary, Glasgow, treated 58 cases with serum, with 6 deaths (all these were in the 38 males, no deaths occurred in the females). Of the 58 cases, 41 belonged to Types I and II, against which only is the serum effective, and 3 of these died. There were no simultaneous controls, but the death-rate in these 58 cases of 10.3 per cent is compared with a death-rate of 18.46 per cent in 856 cases occurring in 1906-29, omitting 1916-18. In their series anaphylactic phenomena occurred in 6 cases, immediate reactions taking place in 2 cases after the first dose. The patients became very short of breath and cyanosed and the pulse failed, but the symptoms rapidly cleared on administration of adrenalin and atropine. In one of these a second dose produced a similar but less severe reaction. In 2 cases urticarial eruptions occurred; late reactions occurred in 2 cases.

R. R. Armstrong and R. S. Johnson<sup>13</sup> have used Felton's serum from three different sources for the treatment of 26 cases, with 3 deaths (*Pigs.* 82-85). They conclude that the course of primary lobar pneumonia due to Types I and II may generally be aborted if treatment is begun within the first three days of the disease, and that the course may be favourably influenced if begun on the fourth or fifth day. It is doubtful if the course is influenced to any extent if treatment is begun later than the fifth day. They find 50,000 units are usually sufficient for early cases of Type I, and 70,000 units for cases of Type II and later cases of Type I. The intervals between doses should be not less than six hours, but may conveniently be extended to twelve hours if treatment is begun within the first three days. The serum must be given intravenously; by no other route can satisfactory results be obtained. Desensitization is unnecessary; 1 c.c. of 1-1000 adrenalin should be injected subcutaneously whenever symptoms of shock occur. The intravenous administration of serum is especially effective in aborting and eliminating toxic phenomena, cyanosis, delirium, etc. Of 18 cases treated within the first four days, 10 were aborted and 7 improved. One patient showed initial benefit but later died. Eight were treated with serum on the fifth and sixth days; 5 were improved and 3 uninfluenced. In 6 of the 26 the first dose was followed by respiratory distress and symptoms of shock; rigors occurred in 12 cases after the first dose, in 10 after the second, and in 4 after the third or subsequent doses. R. A. O'Brien<sup>14</sup> is far from convinced of the efficacy of anti-pneumococcus serum, but agrees that it is our duty to use Type I serum in Type I cases, for in any individual instance the use of serum may easily tip the balance in his favour.

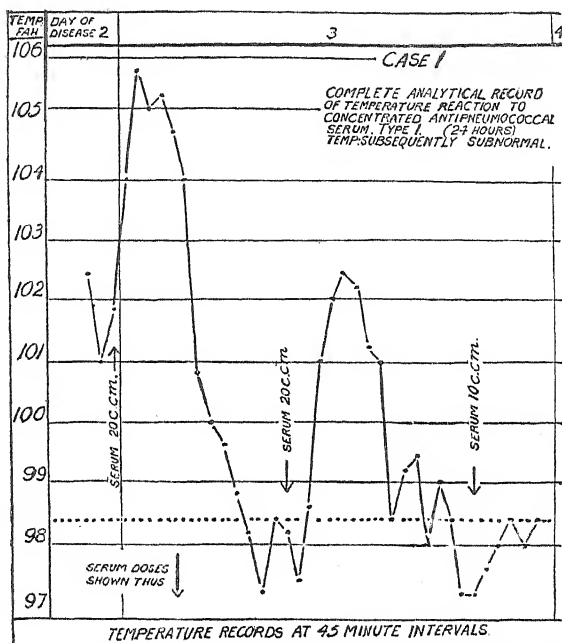


Fig. 82.—Case 1. Male, 38. Onset, sudden; symptoms, typical; signs, consolidation of whole right lower lobe, general bronchitis; dramatic improvement after first dose of serum; shock absent; resolution rapid; pleural pain seventh day of disease. (Figs. 82-85 by kind permission of the 'British Medical Journal'.)

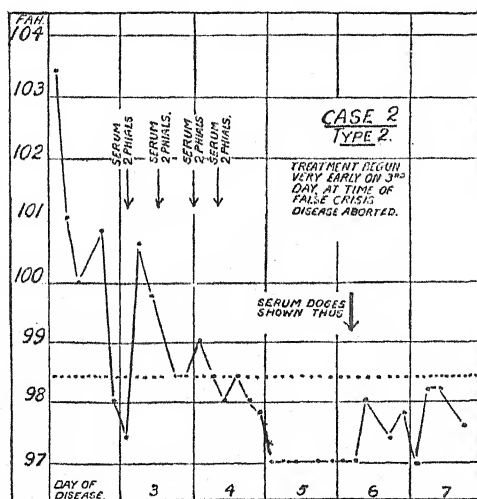


Fig. 83.—Case 2. Male, 32. Onset, sudden; symptoms, severe; signs, consolidation of whole right lower lobe and later of left base; marked improvement after second dose of serum; shock considerable; resolution satisfactory; pleural friction seventh day of illness.

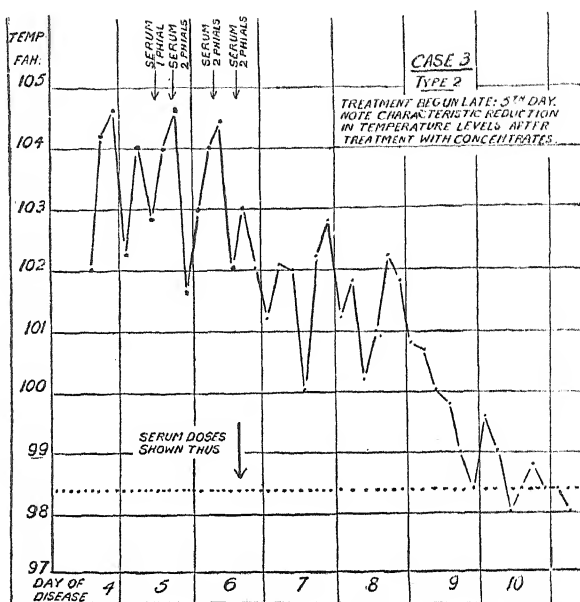


Fig. 84.—Case 3. Female, 21. Onset, sudden; symptoms, severe; signs, consolidation of whole right lung and later of left base; gradual improvement after second dose of serum; shock absent; resolution satisfactory.

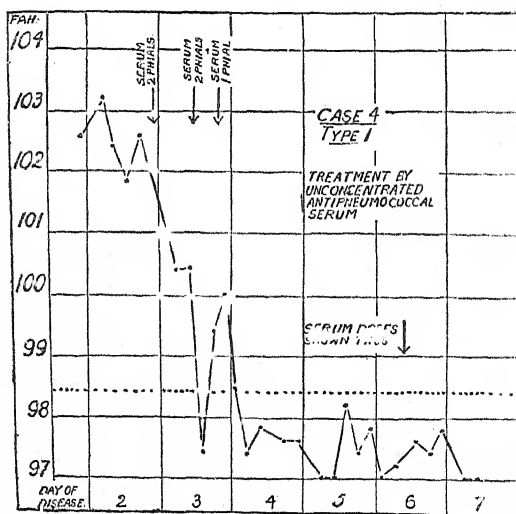


Fig. 85.—Case 4. Male, 35. Onset, sudden; symptoms, typical but moderate; signs, consolidation of left base; improved after first dose of serum; disease aborted; resolution accelerated, almost complete on seventh day.



Too much stress must not be placed on mortality figures in considering the use of serum. Any long series of cases of pneumonia must contain a varying number of bad subjects—alcoholic, senile, cases with systemic diseases, cases obtained too late, and so on—and the recorded experience of competent observers that in many cases the disease may be aborted, that in others there may be a definite change for the better in the course of the disease, and that the febrile period is shortened, must be taken as good evidence in favour of the wider use of Felton's serum. However, if any method of treatment can conspicuously reduce the mortality from pneumonia, it must be such as can be adopted by the general practitioner, for he alone sees cases in the very early stages. There are several difficulties in the way of the widespread use of serum in general practice. The serum is effective in cases of Type I infection and to a less extent of Type II, and if serum is to be used economically the type of infection must be ascertained before injection. Typing is not easily obtained for patients treated in their own homes, and even in well-equipped hospitals there must be some delay. Armstrong and Johnson by their method of injecting a mouse with sputum and testing the peritoneal exudate four hours later have reduced the delay, but R. Cruickshank<sup>15</sup> does not find this method reliable, and prefers to wait for the animal's death, which means a delay of eighteen to twenty-four hours. Sputum may be absent in the early stages, or if present may contain pneumococci which are not the actual infecting ones. Blood cultures and lung punctures may also fail, and in any case entail a delay of twenty-four hours. The alternative is to abandon typing and to inject every case of lobar pneumonia, since two-thirds of the cases of true lobar pneumonia are due to Types I and II in which the serum may do good, and no harm will be done if the infection is due to other types. The supplies of serum are not great and the cost is considerable—£3 a dose, or about £15 a patient. Against this must be offset the saving in nursing and medical expenses if the disease is shortened by its use. It is often impossible in the early stages (and even at post-mortem examination) to distinguish between lobar pneumonia and the prevalent mixed-infection pneumonias, so that abandoning typing would lead to much unnecessary waste of valuable serum and possibly discredit its use by unfavourable statistics. Serum also may have unpleasant immediate and later results, such as rigors, anaphylactic shock, respiratory distress, etc., but these are usually quickly controlled by the use of adrenalin, and should not hinder its adoption.

Serum treatment has undoubtedly gained prestige from the brilliant success of diphtheritic antitoxic serum, although antibacterial sera such as that used for pneumonia are of a very different order to that of antitoxic sera. It has also been generally held that injections of immune sera, though they may do no good, will at any rate do no harm, whereas attempts at active immunity by injections of vaccines have been hindered by the fear of a reaction, a phase of lowered immunity which might do harm, in patients who are gravely ill. W. H. Wynn<sup>16</sup> maintains that reactions can only occur in subjects who are sensitized, whose cells are allergic. The state of sensitization is due to the presence of specific antibodies, and if these antibodies are absent there is no sensitization and a reaction cannot occur. In acute infections such as pneumonia specific antibodies are only present after a certain interval has elapsed, as the process of formation is comparatively slow. It is this interval after infection and before sensitization has occurred that offers us an opportunity of intervening safely with an adequate amount of vaccine. Applying these principles to pneumonia, *Fig. 86* shows the curve of intoxication rising rapidly and then remaining at a high level. Antibodies are at first absent, but begin to appear about the fourth or fifth day; the curve rises slowly at first and

then rapidly, and may reach the curve of intoxication about the seventh day, when in favourable cases a crisis occurs. The problem is to hasten the production of antibodies so that the rise takes place earlier, at a time when the curve of intoxication is still rising. These antibodies, however, are strictly specific, and injection of a vaccine a few hours after the onset of pneumonia will still only produce a rise of specific antibodies several days later when they are being produced naturally. If, then, we depended upon specific antibodies, it would

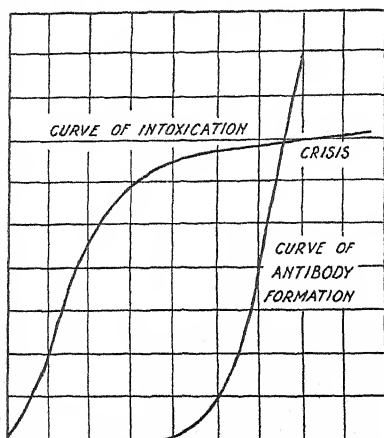


Fig. 86.—Curves (theoretical) of intoxication and antibody production in pneumonia.

be impossible to obtain a rapid effect in controlling the disease. Fortunately a vaccine also has an immediate action in stimulating the production of *non-specific* antibodies. Clinical and experimental results show that there is a rapid and immediate outpouring of bactericidal substances, and it is this form of immunity which is exploited in the early treatment of pneumonia and other acute infections. The aim of **Vaccine Treatment** of pneumonia is therefore to produce an early non-specific immunity whilst the curve of toxæmia is rising, before the toxins are fixed in dangerous or fatal amounts in nerve and heart cells, and whilst the leucocytes are still vigorous and able to respond. In the early stages also the circulation through the lung is unimpeded, and

the organisms are accessible to antibodies in the blood. At a later stage, when the lung is solid, the circulation is interrupted, and even if the blood contains antibodies they cannot easily obtain access to the infected area. With pneumonia and other acute infections there is an interval of time during which the patient is unsensitized and in which prompt action may control or even abort the infection. Wynn urges that pneumonia and other acute infections should be regarded as acute emergencies in the same sense that the surgeon speaks of acute abdominal emergencies, demanding prompt and efficient action. The object is to control the infection before it is out of hand and prevent the development of dangerous symptoms which later we may be powerless to treat. It is probable that the fate of a patient with pneumonia is mainly settled during the first forty-eight hours.

The vaccine used by Wynn is a plain emulsion of the germs sterilized by heat, and as far as possible made from young primary cultures. The various modified vaccines are held to be inferior to the simple vaccine. For lobar pneumonia a vaccine of the pneumococcus only was formerly advised, but as it is often difficult to distinguish at an early stage true pneumococcal pneumonias from those due to mixed infections a vaccine containing equal numbers of the pneumococci, streptococci, and influenza bacilli is now given to all types. Several strains of each are included, but as the immediate non-specific effect is required rather than the later specific effect, it is held to be more important that the vaccine should have a strong antigenic power than that it should contain the various specific types and strains. For an adult experience has shown that a dose of 100 million of each organism, i.e., a total of 300 million, is generally adequate, but two or three times this amount is

often given. For children proportionately smaller doses are used. In any case the important point is to inject as soon as possible after the onset of symptoms, and it is a great advantage that there need be no delay; a stock vaccine can be carried about and injected at once. When patients are injected within

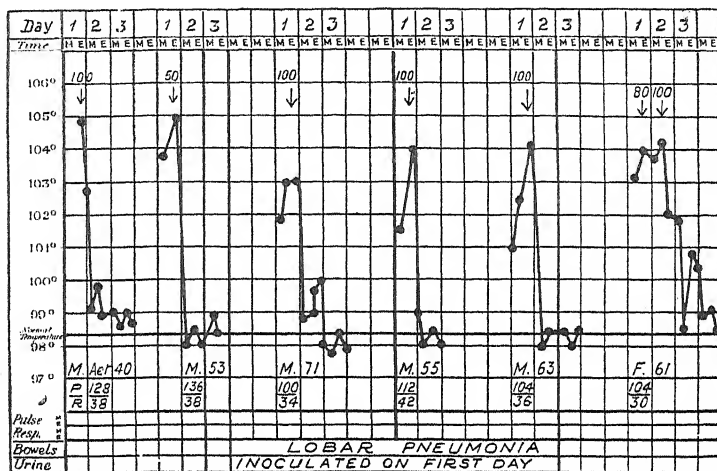


Fig. 87.

(Figs. 87-96 by kind permission of the 'Transactions of the Medical Society of London'.)

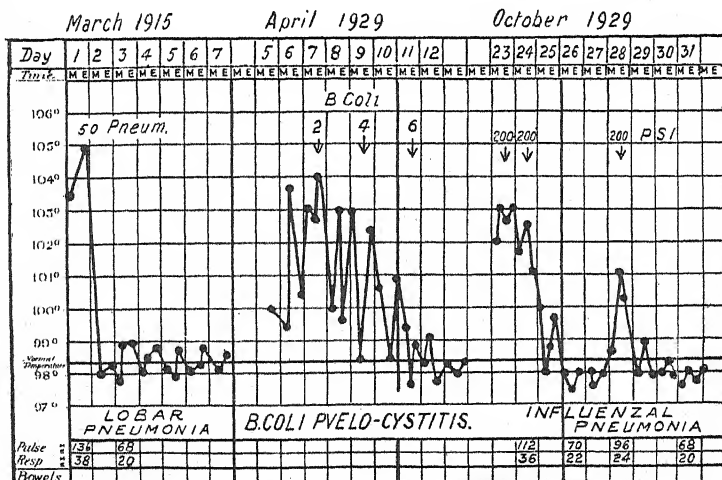


Fig. 88.

the first twenty-four hours in the majority the temperature falls to normal within the following twenty-four to forty-eight hours. When delayed until the second or third day it is harder to overtake the infection, but the results are often striking. At a later stage when the lung is solid and signs of

circulatory failure or nervous exhaustion appear, very little can be expected from any form of specific treatment. Fig. 87 shows charts of patients injected within twenty-four hours of the onset. Fig. 88 shows three charts of the same patient, a man of 53. In 1915 he had lobar pneumonia and was injected

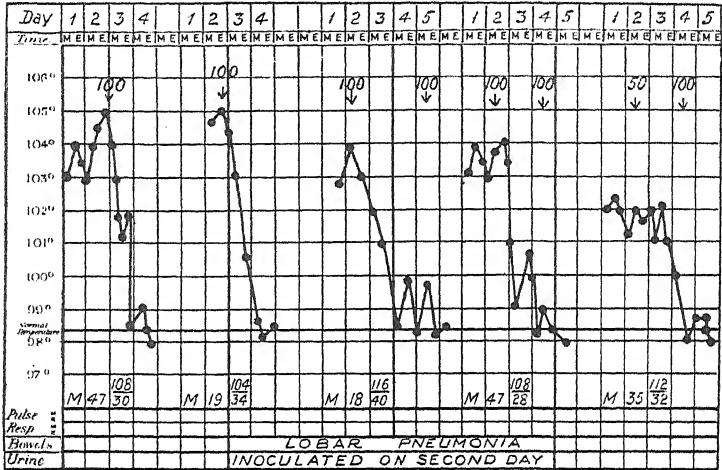


Fig. 89.

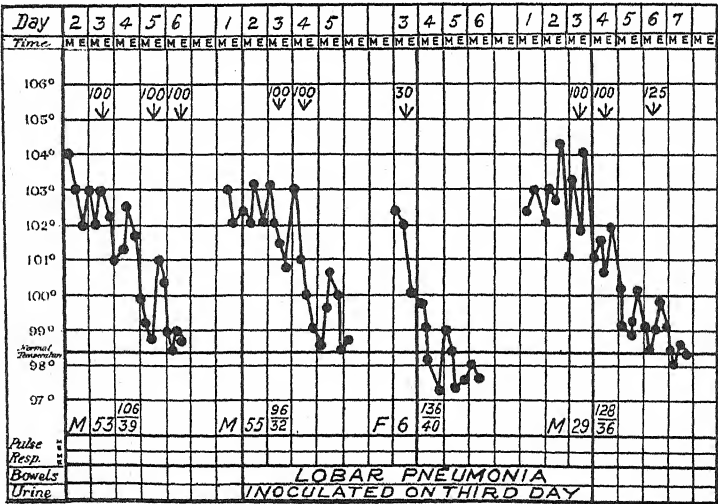


Fig. 90.

within twelve hours of the onset when his temperature was 105°, pulse 136, and respirations 38. There was an immediate response, and his temperature was normal in twelve hours, pulse 68, and respirations 20. Later he had prostatectomy performed, but the urine remained infected with *B. coli*. In

April, 1929, he developed an acute pyelocystitis, which was treated with an autogenous vaccine. As this was a chronic infection to which he was sensitized the doses were small in contrast with the large doses given for the pneumonia. In 1929 he had influenzal pneumonia and was injected after forty-eight hours.

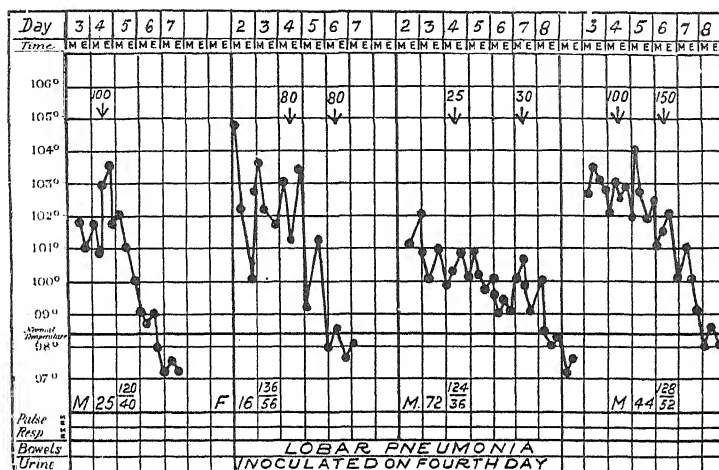


Fig. 91.

These charts well illustrate the contrast between the small dose appropriate for a chronic infection and the larger dose for the unsensitized state of early pneumonia. Succeeding charts show cases injected during the second, third, and fourth day of the disease (Figs. 89-91).

The results obtained in 100 consecutive cases of lobar pneumonia were as follows:—

Table IV.—LOBAR PNEUMONIA.

DAY OF INJECTION	CASES	RECOVERED	DIED	MORTALITY PER CENT
1	10	9	1	2
2	17	17	0	
3	22	22	0	
4	16	13	3	24
5	9	6	3	
6	7	5	2	
7	5	4	1	
8	5	5	0	
Uncertain	9	6	3	
	100	87	13	

The only patient who died among those injected during the first three days was an asthmatic woman who was pregnant at term and in whom labour set in on the second day.

Charts of cases of influenzal pneumonia injected during the first, second, and third days are given (Figs. 92-94), and it will be seen that the results

are very similar to those obtained with lobar pneumonia. Three charts of elderly patients with pneumonia (*Fig. 95*) and four of infants (*Fig. 96*) are also shown. *Table V* gives the results in influenzal pneumonia, 1918-19.

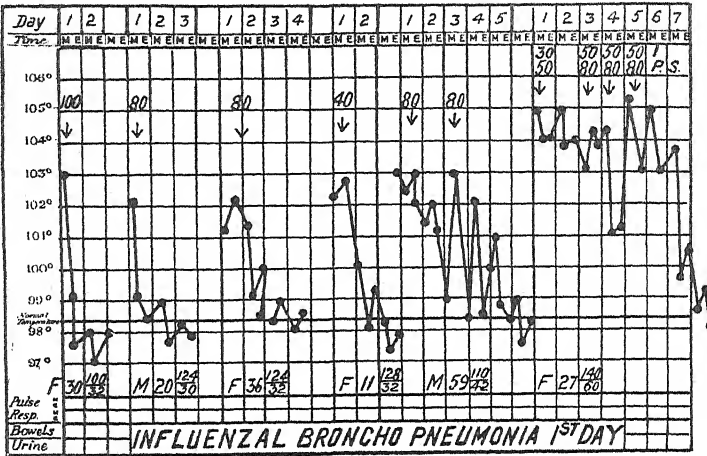


Fig. 92.

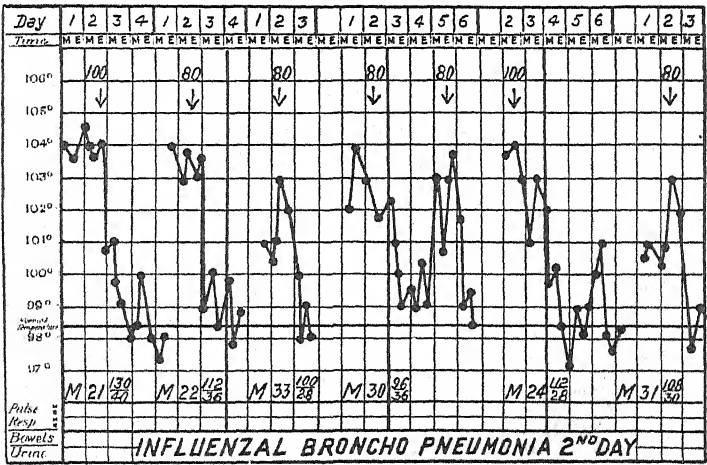


Fig. 93.

Table V.—INFLUENZAL PNEUMONIA.

DAY OF INJECTION	CASES	RECOVERED	DIED	MORTALITY PER CENT
1	28	28	0	4.1
2	23	22	1	
3	22	20	2	
4	20	15	5	20.5
5	14	12	2	

Table VI give the results of vaccine treatment of pneumonia (lobar and influenzal), 1928-30.

The combined results of the three series are shown in Table VII.

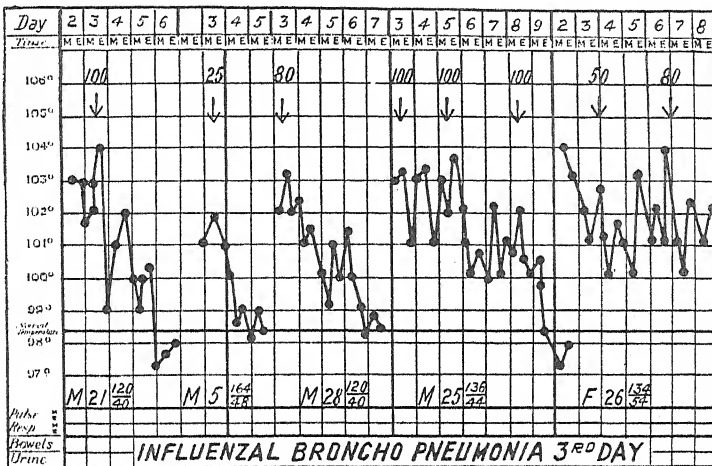


Fig. 94.

Table VI.—RESULTS OF VACCINE TREATMENT IN LOBAR AND INFLUENZAL PNEUMONIA.

DAY OF INJECTION	CASES	RECOVERED	DIED	MORTALITY PER CENT
1	11	10	1	8.6
2	21	20	1	
3	26	23	3	
4	12	9	3	
5	11	10	1	16.3
6	14	13	1	
7	5	5	0	
8	4	3	1	
9, etc.	9	6	3	
	113	99	14	

Table VII.—RESULTS OF VACCINE TREATMENT IN 320 CASES OF PNEUMONIA.

DAY OF INJECTION	CASES	RECOVERED	DIED	MORTALITY PER CENT
1	49	47	2	5
2	61	59	2	
3	70	65	5	
4	48	37	11	
5	34	28	6	20
6	21	18	3	
7	10	9	1	
8	9	8	1	
9, etc.	18	12	6	
	320	283	37	11.5

The results of the combined series show that of 320 patients treated with a vaccine the mortality was 11.5 per cent, but of 180 treated during the first

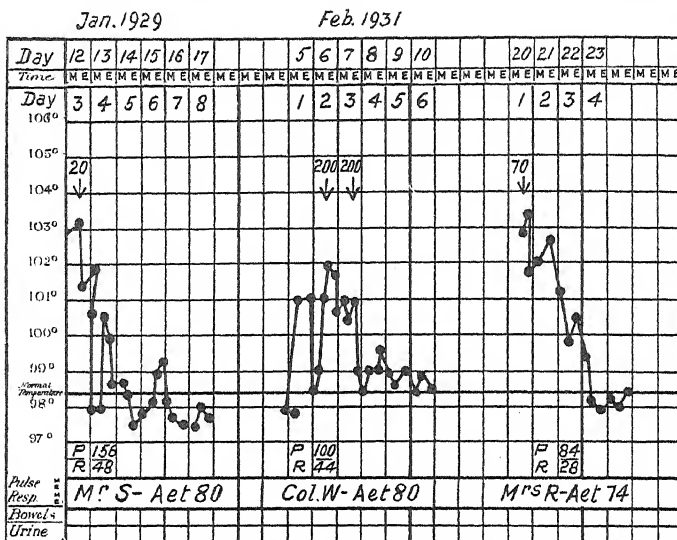


Fig. 95.

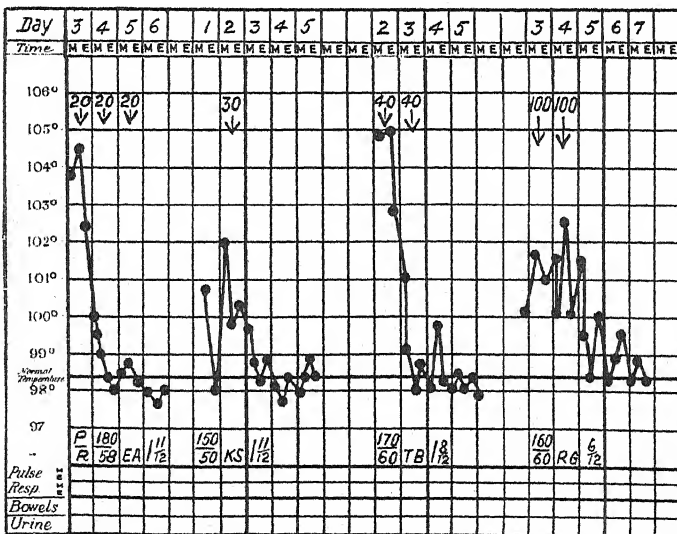


Fig. 96.

three days the mortality was only 5 per cent. In any series of cases, especially those admitted to hospitals, there will be a number of bad subjects, and it



is doubtful if the mortality from pneumonia can be reduced much below 5 per cent. The respective merits of and choice between serum and vaccine treatment require much further study before a decision can be made. Vaccine treatment would seem to have the advantage of immediate application, cheapness, and absence of ill effects, so that it is especially suitable for use by general practitioners. It requires, however, patients who are in a condition to respond to the stimulation by the active production of antibodies. Fortunately this is true of the majority of patients in the early stages of pneumonia. In those few patients who are overwhelmed by the infection from the beginning it would seem more appropriate to use large doses of serum as quickly as possible. The results of both serum and vaccine therapy show that there is a possibility of aborting the infection or shortening its duration by practicable means.

There is some hope that in the not distant future the development of specific antibacterial measures may appreciably reduce the great loss to the community caused by pneumonia, and rob it of its designation as the 'captain of the men of death'.

REFERENCES.—<sup>1</sup>*Jour. Med. Assoc. South Africa*, 1931, Feb. 28, 108; <sup>2</sup>*Practitioner*, 1931, March, 349; <sup>3</sup>*Amer. Jour. Med. Sci.* 1930, Sept., 348; <sup>4</sup>*Lancet*, 1931, i, 625; *Trans. Med. Soc. Lond.* 1931, liv, 252; <sup>5</sup>*Jour. Amer. Med. Assoc.* 1928, Dec. 29, 2035; <sup>6</sup>*Ibid.* 1931, May 2, 1465; <sup>7</sup>*Ibid.* 1930, Nov. 22, 1547; <sup>8</sup>*Ibid.* 1928, Nov. 17, 1503; <sup>9</sup>*New Eng. Jour. Med.* 1930, June 26, 1244; <sup>10</sup>*Amer. Jour. Med. Sci.* 1931, June, 788; <sup>11</sup>*Lancet*, 1930, ii, 1390; <sup>12</sup>*Ibid.* 1937; *Glasgow Med. Jour.* 1931, Feb., 49; <sup>13</sup>*Brit. Med. Jour.* 1931, i, 931; <sup>14</sup>*Trans. Med. Soc. Lond.* 1931, liv, 274; <sup>15</sup>*Glasgow Med. Jour.* 1931, Feb., 59; <sup>16</sup>*Trans. Med. Soc. Lond.* 1931, liv, 258.

#### **PNEUMONIA, POST-OPERATIVE.** (See POST-OPERATIVE COMPLICATIONS.)

#### **PNEUMONOCOINOSSES.**

W. H. Wynn, M.D., F.R.C.P.

Much work has been done in recent years upon this group of diseases, especially since silicosis as a separate industrial disease was isolated from the group.

**Silicosis.**—E. H. Kettle<sup>1</sup> states, as illustrating the importance of silicosis, that in the Rand during the last twenty years £12,000,000 have been paid in compensation to silicotics, mostly Europeans, and their widows and children. Every year between £800,000 and £1,000,000 are paid in compensation, and the industry is further faced with outstanding liabilities in respect of miners who may be expected to develop the disease, which are variously estimated at £6,000,000 to £11,000,000. In Great Britain the dust risks are shared among a number of industries. Excluding coal-miners, some 35,000 workers are employed in the refractories industry, tin mining, pottery, metal grinding, sandstone working, sand blasting, and other trades in which dust is a prominent feature. In different occupations the composition of the dust will vary, but all dangerous dusts have one common factor; they all contain free silica, the dioxide of silicon; and so far as we know the degree of harmfulness of a dust depends upon the amount of free silica in it. Although the pulmonary disability induced by different dusts has received various names, such as 'miner's phthisis', 'potter's asthma', 'grinder's rot', 'chalicosis', 'siderosis', the terminal pathological condition is always the same, and the victims die with advanced pulmonary tuberculosis. Although dust alone may produce disability and death, yet under modern social and industrial conditions silicosis really spells tuberculosis. In August, 1930, an international conference on silicosis was held in Johannesburg. A. J. Hall<sup>2</sup> records his impressions of this conference, and comprehensive articles on the pneumoconioses with special reference to silicosis have been published by E. L. Collis,<sup>3</sup> E. H. Kettle,<sup>1</sup> Lyle Cummins,<sup>4</sup> in England; A. E. Russell,<sup>5</sup> T. H. Belt,<sup>6</sup> G. B. Lawson, W. P. Jackson and

J. E. Gardner<sup>7</sup>, J. A. Britton and J. E. Head<sup>8</sup> in America; C. Garin<sup>9</sup> and A. Feil<sup>10</sup> in France. These articles have been used in the following summary.

The Registrar-General's Decennial Supplement dealing with occupational mortality, published in 1927, throws much light on dust diseases. Other dusts than silica, but not all dusts, can originate respiratory mortalities. The strong correlation between deaths from respiratory tuberculosis, bronchitis, and pneumonia appears to depend upon the mortalities in industries with a silica-dust hazard, in which all three diseases are found to excess. Nevertheless, as Collis points out, bronchitis may be high, as among cotton strippers and grinders, with phthisis low; while phthisis may be high, as among slate masons, with bronchitis low. These instances are, however, exceptional where dust is a causative factor. The outstanding features of mortality in a group exposed to any harmful dust are an excessive mortality from bronchitis and a raised mortality from pneumonia, which mortalities, when the dust contains silica, are characteristically associated with an unusually high mortality, occurring in later life from 'phthisis'. This association with tuberculosis distinguishes silicosis from other forms of pneumoconiosis.

The lung in uncomplicated silicosis presents a variable picture, but the characteristic feature consists of the presence of isolated nodules of fibrous tissue. They vary in size, number, and distribution. In advanced cases a considerable proportion of the lung tissue may be destroyed, with consequent severe respiratory embarrassment. This massive fibrosis, however, is rarely seen nowadays; usually tuberculosis supervenes as a frank, or possibly a modified, infection. Formerly it was held that silicosis was caused by the irritation of the sharp, hard particles, but the present view is that silica becomes soluble in the tissues and that its action is chemical rather than physical. It is also generally accepted that dust inhaled into the terminal alveoli is phagocytosed by the pulmonary macrophages and transported to various parts of the lung. Presumably the silica is gradually dissolved and in its soluble state is able to stimulate the growth of fibrous tissue; but, as Kettle points out, much experimental investigation is required, and we have much to learn about the development of the lesions in silicosis. To produce the condition the silica particles must reach the lungs in sufficient amount over a sufficiently long period of time; they must be less than  $10\ \mu$  in size. Only a few of the particles exceed  $5\ \mu$  in diameter, and the majority are about  $1\ \mu$ . Studies of groups of workers exposed to varying concentration led to the conclusion that ten million particles per cubic foot of a dust containing about 85 per cent of free silica, as quartz, could be tolerated without great injury. Workers exposed to this concentration over long periods developed a mild fibrosis but not of sufficient severity to predispose them to tuberculosis.

Pathologically five stages of the disease are recognized: (1) A fine dry bronchiolitis characterized by an accumulation of dust-containing phagocytes in the terminal bronchioles, with possibly some desquamation of epithelium. (2) The accumulation of dust-containing phagocytes about and in the intrapulmonary lymphoid tissues, and their transportation through the lymphatics into the tracheobronchial lymph nodes. It is not until the next stage is reached that the condition constitutes silicosis in the legal sense. (3) The gradual development of fibrous tissue within the mass of phagocytes and the formation of characteristic nodules of hyaline fibrous tissue. (4) Degenerative changes occur in these foci. (5) The hyaline nodules increase in size by extension at their periphery. Coalescence of adjacent nodules takes place and brings about involvement of further areas of the lung. Macroscopically the changes observed in silicosis are: (1) In the first stage: a variable number of palpable pearly-white nodules up to 2 or 3 mm. in diameter on the pleural surface of the lung.

On section, the cut surface of the lung is studded with pigmented foci, widely scattered, a moderate proportion of which are only just palpable. The tracheo-bronchial lymph nodes are slightly enlarged and deeply pigmented, and may exhibit foci of fibrous induration. (2) Later stages: The fibrotic nodules are increased in number, size, and density, and coalescence of these may be found. The portion of the lung between the fibrotic nodules may be emphysematous. The tracheobronchial lymph nodes are still pigmented, may be smaller in size than those seen in the early stages, and are fibrosed.

The combination of tuberculosis with silicosis may occur at any stage and modifies the clinical, radiological, and symptomatic picture profoundly. Other pulmonary infections may similarly complicate a simple silicotic process and add to its general pathological effect, but the one infection which stands out above all others is tuberculosis. There is abundant evidence that silica has a specific action on the growth of the tubercle bacillus. It was formerly supposed that it was the fibrosis that in some way predisposed to tuberculosis, presumably from interference with lymphatic drainage, but in 1922 W. E. Gye and Kettle<sup>11</sup> showed that interstitial inoculation of silica produced characteristic necrotic lesions and that tubercle bacilli proliferated readily in these lesions. Later it was shown that the active growth of the bacilli did not depend merely on the necrosis of the tissue but was due to the actual presence of the silica. L. U. Gardner<sup>12</sup> experimented with guinea-pigs, using a strain of tuberculosis with low virulence, and quartz dust. Normally the pulmonary lesions caseate in four to six weeks, but the bacilli then die off and healing by resolution takes place in about two years. The infection is practically never fatal. Animals infected with this bacillus were dusted with quartz for eight hours a day over a period of two or three years. The bacilli in the lungs after three to five months took on a new capacity for growth and the process spread to all parts of the lung, massive ulcerative lesions occurred, and the infection spread to the abdomen. The change was not due to an exaltation of the virulence of the bacilli, but appeared to be due to an alteration of environment due to the presence of silica. Exactly how the silica acts, however, is still doubtful.

By existing legislation two distinct groups of cases are compensated: (1) Those suffering from silicosis; and (2) Those suffering from tuberculosis with silicosis. With the increasing experience of recent years, however, it has been realized that all the cases coming under Group I (silicosis) are not identical in the extent of disability, radiological findings, or rate of progress. The Medical Bureau of South Africa divides Group I into two subgroups: (a) simple silicosis, and (b) infective silicosis. The latter show relatively greater disability than their physical signs would lead one to expect, and they get worse much more quickly than cases of simple silicosis, although much less rapid and serious than cases of tuberculosis with silicosis. This conception of infective silicosis was the most troublesome subject discussed at the International Conference, as the visiting delegates were unacquainted with the condition, and it seemed to involve a complete change in our views of the action of silica on tuberculosis. In this infective silicosis radiograms reveal a form of fibrosis in which the individual nodules are larger and more irregular in outline than in typical simple silicosis and tend to coalesce in areas with a somewhat diffuse formation of fibrous tissue; and on naked-eye and microscopic examination the nodules appear to differ from the true silicotic nodules chiefly in the greater tendency to necrosis. The lesions show no histological evidence of tuberculosis, and yet inoculation into guinea-pigs gave positive results, though from the lesions produced the bacillus appeared to be of attenuated type. In the discussions at the Conference it was suggested that silica may damage the bacillus so as to lower its virulence, and it was definitely laid down that "in many cases of

clinically 'simple silicosis' even at its earliest detectable stage, an element of low grade and latent tuberculous infection may already be present in association with certain of the 'silicotic lesions'." It is difficult to reconcile this with experimental data, as all the evidence seems to show that the influence of silica on the tubercle bacillus is always favourable to the bacillus.

Silicosis is a disease of extreme chronicity. It is said never to develop in less than four years' exposure, and massive inhalations are necessary to produce it in so short a time. If the dust risk is not intense, more than twenty years of exposure may be endured before the lesions develop. Recently under the heading of "Acute Silicosis", G. Macdonald, A. P. Piggot, and F. W. Gilder<sup>13</sup> have described two cases arising after short exposures—a girl of 17 after 2½ years and a girl of 19 after 4½ years. Both worked in a factory manufacturing an abrasive powder containing 75 per cent of silica and 25 per cent of sodium carbonate and powdered soap. The suggestion is that the inhaled alkali increased the solubility of the silica and enabled it to act much more rapidly than usual. Kettle, however, is sceptical of this explanation, and considers that advanced tuberculosis was the basal condition in both cases, although it was likely that the infection was enhanced by the inhaled silica. He does not find sufficient evidence of the adjuvant action of the alkali.

Clinically three stages of silicosis can be recognized. In the first stage respiratory symptoms may be slight or absent; working capacity may be slightly impaired; there is a departure from normal of physical signs; and the radiogram shows dense linear and nodular shadows. In the second stage the physical signs are increased in number and size, and there is some degree of impairment of physical capacity. In the third stage all signs and symptoms are grossly exaggerated, with total loss of working capacity. Pulmonary tuberculosis may be present in any of these stages, altering the symptoms, physical signs, and the degree of incapacity. The International Conference recommended the establishment of an international classification of silicosis, an international comparable radiographic technique and terminology, and the institution of further studies in the correlation of radiographic appearances and morbid anatomy.

As regards prognosis, on the whole the hope that early removal from the industry in the first stage of silicosis would necessarily arrest the progress of the disease has not been realized, and it is evident that when a worker has reached the stage of recognizable silicosis he has a definite pathological condition which may or may not progress unfavourably according to various accompanying circumstances, the exact nature of which is obscure. There is also evidence that a certain proportion of workers suffering from simple silicosis may continue in the industry without greater progress in the disease than occurs in those leaving it. The prognosis in cases of declared tuberculosis with silicosis is always serious. It is worse when the tuberculosis occurs at the onset of silicosis in younger than in older subjects, and than in cases of tuberculosis alone. The Conference reached the following conclusions as regards compensation and after-care: (1) Silicosis, complicated or not by tuberculosis, constitutes an occupational disease which may involve reduction of working capacity. (2) The determination of disability calls for expert medical examination at which account must be taken of the clinical and functional condition as a whole. (3) Seeing the very close and serious connections between tuberculosis and silicosis, compulsory removal from the industry should be enforced in all cases of declared tuberculosis. (4) In those countries where legislation provides for compulsory removal from occupations involving exposure to silica dust of workers affected by silicosis, it should not necessarily be applied to workers in the same industry for a period of not less than fifteen years and who have reached the age of 45 years. (See also INDUSTRIAL DISEASES.)

**Anthracosis.**—Lyle Cummins<sup>1</sup> has been engaged for some years in an examination of the lungs of coal-miners. From his investigations emerges the fact that the anthracosis of coal-miners is a dual condition in which the retention of coal-dust in the lungs is associated with, and in all probability due to, a state of diffuse or nodular lung fibrosis and lymph blockage indistinguishable from that found in the silicosis of gold-miners. Not only are the pathological and histological appearances similar, but chemical analysis of the lung ash shows percentages of silica of the same order as those in silicotic lungs. One characteristic feature of silicosis, however, is absent in the coal-miners—the increased liability to tuberculosis. Coal-miners appear to be unusually resistant to tuberculosis, so that there appears to be some factor peculiar to coal-mining which is inimical to the development and spread of tuberculosis in the lungs. Cummins has found that the finely powdered dust of anthracite is capable of adsorbing a large proportion of the active principle from old tuberculin diluted with normal saline, and that it is not unreasonable to assume that the presence of large quantities of carbon particles in the immediate neighbourhood of tuberculous foci might, by adsorbing the products of growth and destruction of tubercle bacilli, go far to prevent or diminish the inflammatory phenomena which constitute tuberculous disease.

But although the phthisis death-rate of miners generally is low, it varies in different coal-fields, and this variation appears to depend upon the amount of associated silicosis. When sinking shafts for coal, but more particularly when driving roads through sandstone rocks, as Collis points out, a small group of miners who specialize on such work are exposed intensively to silica dust, and, as might be expected, they are found to contract silicosis and thereafter to die from tuberculous infection. Here the coal-dust inhaled with the silica fails to inhibit the toxicity of the silica. Coal-dust is present in overwhelming amounts in such lungs, for it cannot get away as usual since it becomes caught in lymph channels blocked by fibrosis. Parts of such lungs become converted into what are almost solid balls of coal. Here is evidence that coal-dust neither inhibits the fibrotic action of silica nor interferes with tuberculous infection being imposed thereon.

REFERENCES.—<sup>1</sup>*Proc. Roy. Soc. Med.* 1930, Nov., 79; <sup>2</sup>*Lancet*, 1930, ii, 655; <sup>3</sup>*Proc. Roy. Soc. Med.* 1931, March, 531; <sup>4</sup>*Lancet*, 1931, i, 235; <sup>5</sup>*Jour. Amer. Med. Assoc.* 1930, Dec. 5, 1714; <sup>6</sup>*Canad. Med. Assoc. Jour.* 1930, Dec., 802; <sup>7</sup>*Jour. Amer. Med. Assoc.* 1931, April 4, 1129; <sup>8</sup>*Ibid.* June 6, 1938; <sup>9</sup>*Presse méd.* 1931, April 18, 568; <sup>10</sup>*Ibid.* 1930, Sept. 10, 1220; <sup>11</sup>*Brit. Jour. Exper. Pathol.* 1922, iii, 241; <sup>12</sup>*Proc. Internat. Silicosis Conf.* 1930; <sup>13</sup>*Lancet*, 1930, ii, 846.

**POISONING.** (See CARBON MONOXIDE POISONING; CORONERS' CASES AND MEDICO-LEGAL WORK; FOOD AND THE PUBLIC HEALTH; INDUSTRIAL DISEASES; SNAKE POISONING.)

**POLYARTHRITIS.** (See JOINT ANKYLOSIS; SYMPATHETIC NERVOUS SYSTEM, SURGERY OF.)

**POLYCYTHÆMIA VERA.** (See ERYTHRÆMIA.)

## POST-OPERATIVE COMPLICATIONS.

*Sir W. I. de C. Wheeler, F.R.C.S.I.*

**Post-operative Nausea.**—W. B. Burnett<sup>1</sup> groups post-operative vomiting under three headings: (1) The anæsthetic; (2) The operation; (3) The subjective nervous reactions of the patient. He states that it is as much the business of an anæsthetist to remove the mucus from the trachea as of a surgeon to remove the sponges from the abdominal cavity before calling the

operation complete. He asks surgeons to remember that injury to the labyrinth in a mastoid case, phrenic irritation in the removal of enlarged cervical glands, and any injury near the diaphragm may induce vomiting in no way due to the anæsthetic. If a punch below the belt can produce nausea to a degree of vomiting, what about the effect of crushing clamps locked on the gut, vigorous pulling on the mesentery, and blanching hot sponges applied to the peritoneum? The delicate and sensitive tissues should not be treated with lack of care.

Burnett condemns the pernicious custom of bringing patients into hospital late in the evening to be operated upon early next morning. The MEDICAL ANNUAL has in many previous numbers pointed out the necessity for rest in bed, the administration of fluids and alkalis, and a carbohydrate diet for some days before operation. **Chloretone**, 12 to 15 gr., on the night before operation is recommended in order to induce sleep; and 15 to 30 gr. should be given an hour before operation, for it acts as a local anæsthetic in the stomach and is a good hypnotic. It has no depressing effect. Morphia should be avoided except for the relief of acute pain. Just before operation, a hypodermic of **Atropine**,  $\frac{1}{100}$  gr., will help in controlling the production of excessive mucus.

**Post-operative Pneumonia.**—Y. Henderson<sup>2</sup> deals with the prevention of post-operative pneumonia. He states: It is now becoming the general practice in surgical clinics to administer an inhalation of **Carbon Dioxide and Oxygen** at the termination of every general anæsthesia. This inhalation was originally introduced as a means of ventilating the anæsthetic out of the lungs and abbreviating or eliminating the post-operative period of subnormal breathing, anoxæmia, and nausea. The procedure is now proving to have a larger value in expanding the lungs and counteracting the development of atelectasis. A single inhalation is not always sufficient. The period within which atelectasis may occur is not limited to the first few hours, or even to the first day or two following operation. The anæsthetist therefore should not consider that his service is ended with the return of consciousness. He should observe the patient for several days after a general anæsthesia, and should administer, as needed, a prophylactic inhalation for the prevention of the development of pulmonary trouble. A simple inhalator, adding carbon dioxide to the inspired air, is all that is needed.

Acapnia, or deficiency of carbon dioxide in the blood and tissues, is a condition closely related to asphyxia, or deficiency of oxygen in the tissues. Either of these deficiencies disturbs the respiratory processes of the tissues, and each involves a considerable degree of the other. Experimentally, a slight degree of acapnia may be induced by over-ventilation of the lungs. A more intense form, capable of producing death by failure of respiration, may result from the excessive breathing in the first stage of badly administered anæsthesia. But in the most severe form of acapnia leading up to surgical shock, the deficiency of carbon dioxide, or decrease of alkali bicarbonates in the blood, arises from a disturbance of the respiratory metabolism of the tissues analogous to asphyxia. Inhalation of carbon dioxide effects a restoration of the alkali bicarbonates and carbon dioxide content of the blood.

The depression of the circulation after operation and anæsthesia (non-hæmorrhagic shock) is due to the lowered activity of the respiratory and other nerve centres that influence skeletal muscles. The result is an atonic condition of all the muscles of the body and a decrease of muscular pressure on the tissues, which permits the blood to stagnate in the venules and decreases the venous return to the heart. This depression of the normal venopressor mechanism is counteracted by inhalation of carbon dioxide. The consequent increase of muscular tonus augments the venous return and restores the volume of the circulation.

After every major surgical operation there is not only a decrease in the volume of air breathed but also a prolonged loss of tonus and relaxation in the thoracic muscles and the diaphragm. The vital capacity of the thorax is thus greatly decreased; the lungs are correspondingly deflated, and occlusion of pulmonary airways readily develops. The air in the occluded lobules, lobe, or lung is then absorbed, and atelectasis is produced. If pathogenic organisms are present they find in the un-aerated, undrained area conditions which favour their growth, and pneumonia may result.

Inhalation of carbon dioxide by counteracting acapnia and inducing deeper breathing inflates the lungs and prevents the development of atelectasis. It is thus a specific preventive of the post-operative pulmonary complications that lead to pneumonia.

H. L. Foss and J. H. Kupp<sup>3</sup> conclude that *embolism* plays the chief part in the production of most post-operative pulmonary complications. Infarctions (minor emboli) are far more common than is generally supposed. These writers believe that: In the light of our present knowledge, treatment of these conditions should consist in: (1) Hyperventilation during and after operation with carbon dioxide and oxygen, as advocated by Scott and Cutler; (2) Change in the position of the patient every six hours, after operation (Sante); (3) Curtailment of sedatives after operation, especially those which depress the cough reflex, and when collapse occurs, the bronchoscopic removal of the mucus or, whenever the other complications considered are present, the use of our newest and most valuable aid, the oxygen tent.

H. Brunn and S. Brill<sup>4</sup> point out that the predominating post-operative pulmonary complication is *atelectasis*. This may be of any extent, from involvement of very small portions of a lung to a whole or both lungs. Bronchial obstruction is the most important single factor in the production of this condition. Sometimes it is due to the presence of an obstructing plug of tenacious sputum, or to a profuse purulent secretion. These writers also recommend CO<sub>2</sub> inhalations and state that the prognosis is excellent.

D. Band and I. S. Hall<sup>5</sup> confirm the diagnosis of post-operative collapse of the lung by X rays. In the treatment CO<sub>2</sub> is supplied from a cylinder containing 10 per cent of the gas in oxygen. The patient receives the gas through an inhaler. The inhalations are given for ten minutes every hour.

**Post-operative Thrombosis.**—Many gynaecologists have recognized that the slowing down of the blood-stream when the patient is kept in the recumbent position in bed is an important predisposing cause of embolism or phlebitis. As a prophylactic against pulmonary embolism, the reviewer allows his patients to move about from the first in bed, and on the second or third day after uncomplicated operations to move about the room. The patients are given 2 gr. of **Thyroid Extract** daily as recommended by Walters of the Mayo Clinics. (The efficiency of thyroid is questioned by some German writers.)

L. R. Braithwaite<sup>6</sup> states that he has tried the thyroid treatment for the last two years and still has catastrophes. He recommends the 'ambulatory' post-operative regimen, particularly in prostate cases. He employs a simple apparatus (Fig. 97) to aid the patient in exercising in bed. There are three pulleys, one (double) at the head and one each (single) at foot and hand. The apparatus is fixed to the head-rail of the bed, and is used first on one side and then on the other. A light cord is threaded through the pulleys as shown in the sketch, and there is a means of lengthening or shortening the length of the cord. The stirrup and handle are of soft, well-padded canvas. It is used for all abdominal operations, beginning as a rule on the fourth day. Some patients will try it earlier and others cannot and will not use it until later; some will not use it at all. At the beginning the patients can only exercise for about two minutes,

but the time soon arrives when they are able to work the apparatus for five minutes at each side. In some cases they enjoy the exercise very much indeed, and will ask for it and work it for longer periods. The idea underlying

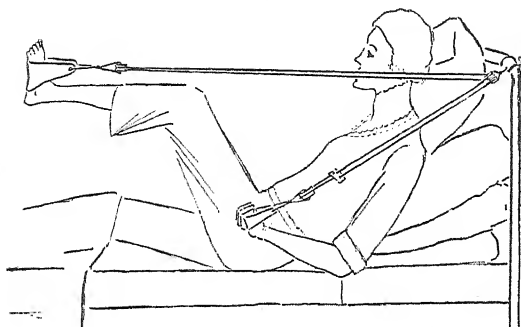


Fig. 97.—A patient using the simple form of gymnastic apparatus described in the text. (By kind permission of 'The Lancet'.)

the exercises is to prevent stagnation of blood, especially in the pelvis and lower abdomen. By pushing with the hand the leg is pulled well up to the abdomen and at the same time very good exercise is given to the arm. In practice it is found that the patient is best in the position shown in the sketch, and under these conditions there appears to be little if any painful drag on the abdominal wound. People who have assiduously

carried out these daily 'jerks' are not only happier for it whilst in bed, but when the time arrives to get up they are much more able to move about.

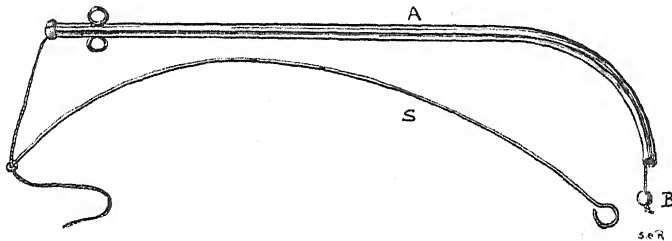
General massage as an immediate post-operative treatment is as a rule highly desirable.

**Pulmonary Embolism.**—G. Nystrom<sup>7</sup> describes his experiences with the **Trendelenburg Operation** for pulmonary embolism, and gives details of eight cases. There have been at least six cases permanently cured after removal of a pulmonary embolus by operation. Trendelenburg states that embolectomy must be performed within forty-five seconds after obstruction of the pulmonary artery has occurred, and this rule seems to have been generally accepted. Nystrom states that under favourable conditions a complete suspension of the circulation for nearly two minutes is not necessarily incompatible with the persistence of life. In one of his latest cases (the patient died on the table) a satisfactory action of the heart was started seven minutes after the patient had ceased to show signs of life. Given a good organization, it should be possible to have the artery cleared and the blood-current re-established within six to eight minutes. As a rule, however, the Trendelenburg operation will be confined to those cases where the pulmonary embolism does not kill immediately, but only within the course of ten minutes. The operation is undertaken before the heart action and circulation have been completely obstructed.

Mistakes in diagnosis have frequently been made. Cardiac insufficiency closely resembles the condition, and uræmia also may do so. One of the many difficulties in the operation is the avoidance of opening the pleura when exposing the heart. The operation entails the removal of the second and third costal cartilages. The finding of the dividing line between the pleural sinuses and the blunt separation of them to expose the pericardial sac without opening one or other of the pleural cavities may be a very delicate task. Below the fourth and fifth costal cartilages on the left side the lines of reflection are more easily distinguished, and on this account Nystrom recommends a modification of the Trendelenburg operation. A longitudinal incision should be made along the left edge of the sternum, extending from the upper edge of the second to the lower edge of the fourth costal cartilages. The intercostal muscles are



divided and the three cartilages with the adjacent parts of the second and third ribs are isolated subperiosteally. This requires extreme care because of the risk of opening the pleural cavity. The cartilages are cut as close to the sternum as possible. The internal mammary vessels are seen, but may not need ligation. In the lower medial corner of the wound where the fourth costal cartilage has been removed, the free surface of the pericardium can be visualized. The mammary vessels are pushed to one side with the pleura. The pericardium is now sufficiently exposed and opened longitudinally. A rubber tube is passed round the base of the aorta and pulmonary artery from right to left. The carrying of this rubber tube round the vessels has given rise to some difficulty, and special instruments have been designed for the purpose. [The reviewer suggests that the instrument designed by him for retrograde catheterization in cases of ruptured urethra would suit the purpose. It consists of a catheter with an open end into which fits a small steel ball held in position by a thread carried through the catheter by a stilette. When the instrument is passed the ball is cut off and the thread passed by a needle through the nose of a rubber catheter. When the thread is pulled taut the rubber nose enters the eye of the metal instrument (*Fig. 98*), and can be withdrawn round the vessels.—W. I. de C. W.]



*Fig. 98.*—Wheeler's metal catheter and stilette (A and S) suggested as a suitable means of carrying a rubber catheter or tube round the pulmonary vessels. B, Metal ball.

There is no difficulty in recognizing the pulmonary artery in cases of pulmonary embolism. It is swollen and pulseless. The tube is used as a temporary tourniquet and at the same time brings the large vessels to the surface of the wound. Nystrom says that the rubber tube should not be pulled tight until a moment after the vessel has been opened, in order to allow the emboli in the heart to enter the artery. Too strong pressure with the rubber tube is dangerous. It may cut through the posterior portion of the artery. The right branch of the pulmonary artery passes across the operative wound in the direction of the right axilla. The left branch occasionally is not so easily recognized. It bends directly backwards. Trendelenburg recommends the extraction of the emboli from the artery with special forceps. Nystrom suggests a suction apparatus. Finally, the slit in the pulmonary artery is clamped with very fine curved forceps and fine interrupted sutures are employed to close the wound. If the heart is feeble and irregular an injection of 1 c.c. of 1-1000 **Adrenalin** solution into the aorta has stimulated the heart's action.

From reading the literature in connection with successful operations for the removal of pulmonary emboli, it would appear absolutely necessary to have a perfect organization, and that it is desirable, if this dramatic treatment is to be attempted, that every instrument and appliance should always be ready at hand. Those taking part in the proceedings should together become familiar with the exact anatomy by practice on a dead body.

**Post-operative Parotiditis.**—F. W. Rankin and B. M. Palmer<sup>s</sup> comment on the increased incidence of post-operative parotiditis with the development

of surgery of the colon : 20 of 78 cases followed major surgical operations on the colon or rectum.

**ETIOLOGY.**—A review of the discussions of various authors on the etiology of post-operative parotiditis suggests five different theories : (1) According to the pyæmic theory, secondary parotiditis is a pyæmic phenomenon due to embolism of the parotid vessels, with a septic clot derived from the primary focus of infection ; (2) By the heat degeneration theory, it is recognized as a parenchymatous degeneration of the gland due to hyperpyrexia ; (3) In the toxin excretion theory, it is attributed to infection of the gland following an unsuccessful attempt to excrete toxin manufactured by the organisms of the primary disease ; (4) In accordance with the sympathetic theory, parotiditis is produced sympathetically, secondary to operations on the generative organs ; and (5) According to the duct infection theory, it is produced by direct extension of micro-organisms along Stenson's duct from the mouth.

**TREATMENT.**—All authors are in agreement that as soon as suppuration can be definitely recognized, the gland should be incised, but there is disagreement as to just when suppuration is present. The only sign which is pathognomonic of suppuration in the parotid gland is fluctuation ; when this appears the gland should be lanced. It is most unwise to lance a gland in the hope of penetrating to a region of deep suppuration, because one may be disappointed in finding it, and injury to the facial nerve is almost certain to result. Rankin and Palmer have frequently seen glands rupture and discharge from the ear before suppuration could be demonstrated by the sign of fluctuation, and then, after the gland has been lanced, have seen a satisfactory outcome. Unnecessary drainage of the gland, and, perhaps, spread of the infection, are frequently avoided by waiting for a definite sign. In many cases, under the influence of hot fomentations or ice, as the choice of the surgeon indicates, suppuration never appears. The authors' experience with radium also has been that it tends to prevent suppuration. Not only may one mistake infection for suppuration about the third or fourth day after operation, but frequently, if one is not in a hurry to incise the gland, drainage from Stenson's duct may take place to relieve the condition.

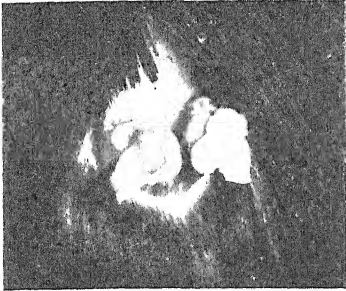
These writers refer in detail to the treatment with **Radium**. By using radium, and particularly by its immediate application within one or two hours following beginning of the swelling in the region of the parotid gland, they have been able, by reduction of the incidence of suppuration and absorption, to decrease noticeably the morbidity and the mortality. To be most advantageously employed, radium must be applied as soon as the first symptom of parotiditis appears. In their cases, as soon as the satisfactory results from the use of radium were observed, they attempted to apply it at the very earliest possible moment ; regardless of the time of day or night that a swelling of the parotid gland appeared post-operatively, radium packs were used. The technique of treatment varies somewhat with the severity of the disease, but, ordinarily, a large dose is not necessarily more effectual than one of medium size. The maximal dose administered was four applications, eight hours in duration, at intervals of eight hours, of four 50-mgrm. tubes of radium. Filtration was through 2 mm. of lead, 1 mm. of brass, and 0.5 mm. of silver ; the distance was 2.5 cm., and the total mgrm.-hours 6605. The minimal dose used was two applications, eight hours in duration, at intervals of eight hours, of two 50-mgrm. tubes ; filtration was through the same materials as those used in the maximal dose ; the total dosage was 800 mgrm.-hours.

**REFERENCES.**—<sup>1</sup>*Canad. Med. Assoc. Jour.* 1930, Sept., 406 ; <sup>2</sup>*Jour. Amer. Med. Assoc.* 1930, Aug. 23, 572 ; <sup>3</sup>*Surg. Gynecol. and Obst.* 1930, Dec., 798 ; <sup>4</sup>*Ann. of Surg.* 1930, Nov., 801 ; <sup>5</sup>*Brit. Jour. Surg.* xix, 387 ; <sup>6</sup>*Lancet*, 1930, ii, 524 ; <sup>7</sup>*Ann. of Surg.* 1930, Oct., 498 ; <sup>8</sup>*Ibid.* Dec., 1007.

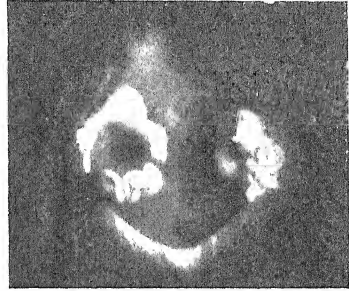
## PLATE XLVII

### THE ZONDEK-ASCHEIM TEST FOR PREGNANCY

(EDWIN M. ROBERTSON)



*Fig. A.*



*Fig. B.*

*Figs. A and B.*—Dorsal exposure of ovaries at examination. Blood points in left ovary in *Fig. B.*



*Fig. C.*—Dissection to show positive ovaries *in situ*. Blood points in both ovaries.

*Plates XLVII and XLVIII by kind permission of the  
'Edinburgh Medical Journal'*

PLATE XLVIII

THE ZONDEK-ASCHHEIM TEST FOR PREGNANCY—*continued*

(EDWIN M. ROBERTSON)



*Fig. D.*



*Fig. E.*

*Figs. D and E.*—Sections of ovaries from test mice. *Fig. D* from negative case.

*Fig. E* from positive case, with blood point at lower pole.

## PLATE XLIX

### HORMONE TEST FOR THE DIAGNOSIS OF EARLY PREGNANCY

(P. F. SCHNEIDER)



A, Bicornuate uterus, tubes, and ovaries of a 14-week rabbit, 30 hours after injection of 7 c.c. of urine from a non-pregnant patient. This demonstrates a negative result, with no changes occurring in the ovaries. B, Bicornuate uterus, tubes, and ovaries of a 14-week rabbit, 30 hours after injection of 7 c.c. of urine from a pregnant patient. This demonstrates a positive result from an approximately 5-weeks pregnancy, showing the presence of numerous corpora lutea and corpora hemorrhagica.

*By kind permission of  
Surgery, Gynecology and Obstetrics*



**POST-VACCINAL ENCEPHALITIS.** (*See VACCINATION.*)

**PREGNANCY, ANÆMIA OF.** (*See ANÆMIA, PERNICIOUS.*)

### **PREGNANCY AND ITS COMPLICATIONS.**

*Beckwith Whitehouse, M.S., F.R.C.S.*

**The Diagnosis of Pregnancy: The Zondek-Aschheim Test.**—The last year has seen the publication of much work both in Europe and America upon the Zondek-Aschheim hormone test for the diagnosis of early pregnancy. All observers are agreed upon the reliability of the test, the margin of error amounting to approximately 2·5 per cent, a very low figure for a reaction involving biological methods. S. Aschheim<sup>1</sup> reports 98·8 per cent accuracy in one thousand personal cases, and 98·3 per cent accuracy in 1829 cases reported in the literature. It is evident, therefore, that the test must be regarded as a valuable aid to diagnosis. The test depends, of course, upon the presence in the urine from the earliest weeks of pregnancy onwards of a hormone produced by the anterior lobe of the pituitary. Two components of this hormone are distinguished by Aschheim and Zondek under the terms 'Prolan A' and 'Prolan B'. The former causes maturation of the Graafian follicle in the ovary; Prolan B, on the other hand, is responsible for development of the corpora lutea, and only appears in the urine during pregnancy. Prolan A occurs in the urine under other conditions, e.g., menopause, functional amenorrhæa, some ovarian neoplasms, and in certain cases of pelvic inflammation. It is, therefore, upon the presence of Prolan B that the diagnosis of pregnancy depends.

The test as carried out by most workers is briefly as follows: The first urine of the day is used owing to its high hormone content. It is filtered, and, if not already acid, it is slightly acidified with acetic acid. Five white mice each weighing 6 to 8 gm. and from three to five weeks old are employed, both age and weight being important factors in a successful technique. The urine is injected subcutaneously in decreasing doses respectively of 0·2, 0·25, 0·3, and 0·4 c.c., the injections being given twice the first day, three times the second day, and once the third day. One of the mice is killed on the fourth day and the ovaries are examined. In a positive reaction one or more blood-filled follicles project from the surface. These hæmorrhages into Graafian follicles, or 'Blutpunkte', constitute the criterion of a positive test. The 'blood-points' are easily visible to the naked eye, as is shown in *Plates XLVII, XLVIII*, representing two positive reactions against a negative control (E. M. Robertson<sup>2</sup>). Should the first mouse of the series prove negative, the remaining four are left until the following day before the ovaries are submitted to examination.

One of the technical difficulties in performing the test is that about 6 per cent of the urines are toxic and the animals die. To overcome the toxicity and loss of test animals, B. Zondek<sup>3</sup> has recently suggested passing the urine through a Berkefeld filter, or shaking it with ether and discarding the ether fraction. Favourable results by this method have been reported by W. Stewart,<sup>4</sup> H. S. Finkel,<sup>5</sup> G. H. Ettinger,<sup>6</sup> and others. Thirty to forty cubic centimetres of urine, after filtration and acidification, are mixed for three minutes with 120 c.c. of ether. The urine, separated from the ether by means of a funnel, is then allowed to stand for an hour or is heated on a water-bath to 45° C. until all traces of ether have evaporated.

B. F. Wiesner,<sup>7</sup> at the Edinburgh Pregnancy Diagnosis Department, states that he has not found Zondek's ether modification quite satisfactory, and prefers the addition of sulphosalicylic acid as a detoxicating agent. To each

25 c.c. of urine 1 grm. of sulphasalicylic acid is added. The urine is allowed to stand for half an hour and is then filtered. The filtrate is neutralized with sodium bicarbonate, and is then ready for injection.

To obtain a reliable opinion with the Zondek-Aschheim test, three or four days are required. M. A. Friedman,<sup>8</sup> working with rabbits instead of mice, has reported that it is possible to decrease the time element and simplify the technique without sacrificing the accuracy of the test. P. F. Schneider<sup>9</sup> reports favourably upon Friedman's modification, which is also being investigated by Wiesner and Aschheim. These writers consider that it is too early as yet to assess the practicability of the test. In Wiesner's hands all the urines that gave a negative reaction with the standard Aschheim-Zondek test also gave a negative result in the case of rabbits. Some urines, however, that gave a positive reaction in mice did not give a positive rabbit reaction.

The technique for the Friedman test requires the use of a female rabbit 12 to 14 weeks of age. From 5 to 7 c.c. of morning urine is injected into the marginal ear vein, the specimen being filtered but not necessarily detoxicated. In twenty-four to thirty hours the rabbit is killed and the ovaries are examined. If negative, they remain small and show no evidence of physiological activity. If the test is positive, numerous hæmorrhagic follicles and corpora lutea are present in each ovary, as shown in *Plate XLIX*. A striking contrast is at once evident between the inactive and the active ovaries, and it is unnecessary except for confirmatory data to submit the organs to microscopic investigation.

Schneider emphasizes the importance of only utilizing rabbits 12 to 14 weeks old. If animals under 3 months are used the results are not constant, whilst, if not over 14 weeks, the possibility of ovulation from other causes is reduced to a minimum.

**Pregnancy and Tuberculosis.**—In a discussion on the management of pregnancy, parturition, and the puerperium in tuberculous women, held at the Royal Society of Medicine, A. W. Bourne<sup>10</sup> refers to the very wide diversity of opinion that exists both as to the effect of pregnancy upon a tuberculous lesion, and also on the correct treatment to be adopted. Men of equal distinction in all the clinics of the world apparently hold diametrically opposite views. Bourne's personal views are that when the pulmonary lesion is healed and inactive, pregnancy is of no consequence; it is unfortunate where there is an active infection, and a disaster if the disease is advanced. Healed tuberculosis is not a contra-indication to pregnancy. Bourne also expresses the view that therapeutic abortion in general has no place in the treatment of pregnancy and phthisis. The ultimate outlook is commonly not improved and may indeed be worse, even if abortion is performed as early as the eighth week of gestation. Here and there there may be an exceptional case, but the writer is of opinion that the proper course is to treat the disease and leave the pregnancy alone. Obstetricians should therefore advise against the induction of abortion for all but the occasional exceptional case.

Carnac Rivett<sup>11</sup> advocates full sanatorium treatment throughout the whole of pregnancy and for at least six months afterwards wherever pregnancy is complicated by an active tuberculous lesion. If the lesion is markedly increasing in activity during the early weeks of pregnancy, Rivett is in favour of termination of the gestation. On the other hand, after the twentieth week he allows pregnancy to go on until the child is viable, on the presumption that the tuberculous lesion will progress rapidly after delivery, whether such be at term or earlier. In actual practice adequate sanatorium treatment during and after pregnancy is difficult to carry out, owing, in Rivett's opinion, "to the enormous amount of red tape roped round all the sanatoria under the jurisdiction of the Public Health Authorities and to the inexplicable



aversion of the average tuberculosis officer to have any contact with an obstetric case."

In those few cases before the twentieth week where the decision is taken to terminate the pregnancy, the method of choice, according to Margaret Salmond,<sup>12</sup> is the insertion of a No. 7 self-retaining rubber catheter into the uterus and the injection of 5 c.c. of glycerin. One or two laminaria tents are inserted at the same time and the vagina is packed with gauze soaked in glycerin and flavine. The pack is removed in twenty-four hours. Abortion usually occurs in from thirty to forty hours, the tube and tents being expelled at the same time. This method has the advantage that it avoids shock and hæmorrhage, and moreover can be carried out without an anæsthetic if morphine is administered before the operation.

With regard to sterilization of tuberculous patients, the general opinion expressed at the discussion was that as a routine it is unnecessary. Salmond considered that future pregnancies might be permitted when healing of the tuberculous lesion had taken place.

(See also TUBERCULOSIS, PULMONARY.)

REFERENCES.—<sup>1</sup>*Die Schwangerschafts-diagnose aus dem Harn*, 1930, S. Karger, Berlin; <sup>2</sup>*Edin. Med. Jour.* 1930, Aug., 124; <sup>3</sup>*Klin. Woch.* 1930, May 24, 964; <sup>4</sup>*Lancet*, 1931, i, 1347; <sup>5</sup>*New Eng. Jour. Med.* 1931, Jan. 29, 203; <sup>6</sup>*Canad. Med. Assoc. Jour.* 1931, April, 491; <sup>7</sup>*Brit. Med. Jour.* 1931, i, 860; <sup>8</sup>*Amer. Jour. Physiol.* 1929, xc, 617; <sup>9</sup>*Surg. Gynecol. and Obst.* 1931, Jan., 56; <sup>10</sup>*Proc. Roy. Soc. Med.* 1931, June, 1123; <sup>11</sup>*Ibid.*; <sup>12</sup>*Ibid.*

## PREGNANCY, THE HEART IN.

A. G. Gibson, M.D., F.R.C.P.

G. Hermann and E. L. King<sup>1</sup> make some observations on cardiac disease in relation to pregnancy. Disturbance of the cardiac mechanism as recorded by the electrocardiograph is not necessarily a bar to successful pregnancy unless complicated by myocardial insufficiency. Of two patients with complete bundle branch block and severe rheumatic heart affection, one with mitral stenosis and insufficiency died with her baby during spontaneous delivery. The second patient, with mitral stenosis, auricular fibrillation, and congestive heart failure, died in the eighth month of her sixth pregnancy. A third patient, with rheumatic endocarditis, had recovered from pregnancy, leaving a damaged heart, and was successfully delivered by Cæsarean section. A fourth patient, who had had complete heart-block from the age of 20, had six successful deliveries without any complications. A fifth patient, with paroxysmal tachycardia and rheumatic mitral insufficiency, was delivered of her ninth baby without any difficulty.

A second group of patients, with chronic valvular disease, mainly mitral stenosis, without disturbances of rhythm but with insufficiency, can be helped considerably by careful régime during pregnancy. One of the authors' patients was delivered at the seventh month by Cæsarean section. A second, who did not respond to rest and digitalization, was delivered by Cæsarean section, but died. Four other patients were successfully treated. The authors have observed two patients with severe congenital heart disease who have gone through pregnancy and labour without difficulty, and they have observed patients who have had mild attacks of acute rheumatism that have subsided before parturition.

H. Peham<sup>2</sup> makes a systematic review of cardiac defects in pregnancy, of which he finds 2.02 per cent. There were 105 cases of mitral stenosis, with 8 deaths, and in 27 cases of combined lesions 9 deaths. Of 38 women with severe cardiac insufficiency, pregnancy was interrupted in 21, and of these 17 died. Four died of cardiac insufficiency during the first half of pregnancy. In the second half of pregnancy 2 women died undelivered, and 3 died in

labour or immediately after delivery. Of the remaining cases, 8 developed cardiac insufficiency during the second half of pregnancy and died during the first three weeks after delivery. Any serious cardiac failure, therefore, in conjunction with pregnancy is an extremely grave condition. The author is of opinion that interruption of pregnancy should be considered only when the patient fails to improve or becomes worse.

REFERENCES.—<sup>1</sup>*Jour. Amer. Med. Assoc.* 1930, Nov. 15, 1472; <sup>2</sup>*Surg. Gynecol. and Obst.* 1931, Feb., 52.

## PREGNANCY AND SYPHILIS. (See SYPHILIS.)

### PROSTATE, DISEASES OF.

*Sir John Thomson-Walker, F.R.C.S.*

**Prostatic Abscess.**—A clinical study of 42 well-developed cases has been made by I. C. Sargent and R. Irwin.<sup>1</sup> The condition is usually associated with gonorrhœa, but in this series there was no history or evidence of gonorrhœa in 10 cases. The following antecedent infections were noted: extensive furunculosis, acute rheumatic fever, oral sepsis, and acute abscess at the site of a chronic osteomyelitis. In one patient a staphylococcal abscess was found in a prostate that was the seat of carcinoma. Frequency and strangury were constant symptoms and rectal or perineal pain was present in 50 per cent of the patients. Under 50 per cent had fever before operation and none had a definite rigor. Fever when present rarely exceeded 101° F. About 50 per cent had complete retention of urine, and all had some difficulty in passing water. Fluctuation observed on rectal examination was present in less than 25 per cent. In the remainder the prostate was felt to be tender, enlarged, often tense, and often extending indefinitely upwards along one or both seminal vesicles, or outwards to the pelvic wall. In regard to treatment, the authors conclude that in any acute prostatic inflammation it is safe to wait until careful observation permits of a definite diagnosis of abscess formation; that both prostatic lobes should be opened whether or not the signs indicate bilateral abscess formation; that any method involving opening of the abscess into the posterior urethra entails unnecessary risk of a persistent urethritis owing to the formation of a false cavity; that drainage through an external urethrotomy wound unduly lengthens the course of the disease, favours the development of epididymitis, and leads to the risk of a more or less persistent urinary fistula; and, finally, that no method offers more certain cure and freedom from complications than that of a perineal dissection combined with posterior prostatotomy.

### Prostatic New Growths.—

R. S. Ferguson<sup>2</sup> describes his method for the *diagnosis of prostatic neoplasms* by means of needle puncture and aspiration, which he claims to have been very satisfactory in that he was able to obtain tissue from the prostate for examination in 70 per cent of aspirations. The patient is placed in the lithotomy position, and at a point one inch in front of the anus, just beside the median raphe the skin is infiltrated with 1 per cent novocain. With a finger in the rectum as a guide novocain infiltration is then carried out down as far as the prostatic capsule. A sterile Record syring fitted with an 18-gauge needle 6 in. long, and with a long, sharply bevelled point, is inserted with the right hand into the perineum, avoiding the mid-line, and carefully guided to the prostatic capsule so as to avoid injury to the rectal and urethral walls. The plunger with which the piston is fitted is now withdrawn as far as possible to create a vacuum as the needle is being advanced in a straight line through the prostate, and made to traverse any suspected nodule of tissue and draw up into the needle a small plug therefrom. The material in the needle is

expressed on a glass slide and smeared with a second glass slide, using firm but gentle pressure as for a blood-smear. The smear is fixed by gentle heat and then stained and mounted. While it would be unwise to base a diagnosis on a single cell or a very small group of cells, it is usually easily possible to find enough material scattered throughout the smear which can lead to a definite conclusion that the tissue is or is not cancerous. (*See also* BIOPSY BY NEEDLE PUNCTURE AND ASPIRATION.)

Kenneth Walker<sup>3</sup> emphasizes the insidious nature of the clinical course of *malignant disease of the prostate*. Not infrequently the disturbance of health to which it gives rise is general rather than local, and the doctor's attention is directed to debility and loss of weight, intractable sciatica, or constant pain in the lumbosacral region, urinary symptoms being absent or very slight. A surprising feature of the disease may be the small size of the primary malignant focus as compared with the extensive secondary infiltration which may be found on X-ray examination of the sacrum and ilium.

Chronic prostatitis is another condition which may give rise to signs and symptoms that seem entirely remote from any lesion of the genito-urinary tract. The patient may complain merely of vague pains over the lumbosacral region, sometimes of sciatica or of chronic rheumatism. Occasionally recurrent iritis results from such a cause. Next to the teeth the prostate is most commonly the primary focus of infection in cases of chronic fibrositis or synovitis. Similarly, in cases of benign enlargement of the prostate, general symptoms such as dyspepsia, dryness of the mouth, loss of appetite, thirst, headache, nausea, vomiting, or bowel irregularity and flatulence, may be the symptoms for which the patient seeks advice, such symptoms indicating the onset of uræmia.

If mistakes in the diagnosis of prostatic disease are to be avoided, a careful rectal examination, followed in cases of doubt by microscopic investigation of the fluid expressed from the prostate, together with X-ray examination of the pelvis, must form a part of the routine examination of any male patient complaining of symptoms of an obscure nature.

J. D. Barney<sup>4</sup> also draws attention to cases of carcinoma of the prostate without urinary symptoms. While cancer of the prostate may rarely exist with no symptoms whatever, it not uncommonly gives rise to objective or subjective symptoms localized to parts of the body other than the urinary tract.

B. S. Barringer<sup>5</sup> analyses a series of 280 cases of carcinoma of the prostate and states that, even if an early diagnosis is made, there is no general agreement as to the best method of treating this condition. He considers that while the possibilities of radical surgical treatment are exhausted there has been gradual improvement in the control of carcinoma of the prostate by **Radiation**. At the time of the first examination, 221 were classified as advanced cases while only 20 could fairly be classified as early cases. Of the total 280 cases 241 were treated by radium and X rays, and, in spite of the far-advanced type of case, 5 out of 46 are alive and well after five years. These cases were treated by the insertion of steel radium-bearing needles through the perineum into the prostate and seminal vesicles. Small doses, 200 to 300 millicurie-hours for each needle, were utilized, repeating the dose every two or three months until the condition appeared to be controlled and no evidence of regression was found. These 46 cases constituted the writer's first series. Since then glass radon seeds, X-ray radiation, the radium-element pack, radon filtered by platinum, and latterly gold radon seeds have all been used, alone, and in various combinations, and in spite of the necessity for the continual change in the methods of radiation, the writer reports a further 8 out of 40

patients alive and well for periods over five years. He believes that in most cases of prostatic carcinoma a much larger dose of radium than has heretofore been used is necessary to control the disease, and to achieve this purpose the writer now prefers to implant throughout the entire tumour radon seeds of 2 millicuries each to every cubic centimetre of new growth through a suprapubic incision rather than by the perineal route.

**Prostatic Enlargement and Prostatectomy.—**

J. C. Webb and S. L. Mucklow,<sup>6</sup> in an article advocating *non-operative treatment of the 'senile prostate'*, state that surgical interference is called for in all cases of senile prostate where there is much residual urine, definite enlargement into the bladder as proved by cystoscopic examination, cystitis, or evidence of back-pressure affecting the kidney. Where, however, the above conditions are not present, they consider that "deep **Radiotherapy**, with or without diathermy and static wave," should be employed. In the case of a small hard fibrous prostate the last two forms of treatment alone often give the best results. Such non-surgical methods are thus advocated by the writers: (1) In early cases; (2) Where the heart, lungs, or general condition, or the age of the patient contra-indicate operation; and (3) When the patient does not wish for surgical interference. They state that when relief has been obtained it is important that the patient should be kept under regular periodic observation, as the symptoms may recur, and further application may be necessary. The results following their treatment in sixteen cases are described.

Keyes<sup>7</sup> calls attention to the importance of the *infection that occurs during the treatment which is carried out as a preliminary to prostatectomy*. He suggests that complications and deaths attributed to renal infection and septicæmia are usually due to infection originating in the prostate as the results of traumatism from the passage of the catheter, or to infection in the pelvic cellular tissue as the result of suprapubic cystotomy. He states that catheter infection is usually primarily an acute prostatitis set up by traumatism to a prostate which is probably already infected, and can therefore only be prevented by the elimination of drainage by means of the catheter. He performs preliminary cystotomy with suture of the bladder muscle to the rectus sheath so as to exclude the prevesical space, which is followed by bilateral vasectomy. Keyes reports that during the period that he was developing and subsequently practising this technique 278 cases of prostatic obstruction came under his care, of whom 14 per cent refused or were refused operation, 15 per cent died of the disease or of the treatment, and 71 per cent survived the operation. During this period he, personally, performed 113 prostatectomies with 7 deaths, and his associates at the hospital performed a series of 46 prostatectomies not employing the writer's technique, so as to give a control series of cases, and in these there were 6 deaths.

[The danger of pelvic cellulitis from opening the prevesical space is the subject of recurring comment in the writings of American surgeons, and the old practice of stitching the bladder to the abdominal wall is advocated as a method of prevention. This method, according to my experience, is likely to lead to fistula, and it is quite unnecessary if free drainage of the bladder and prevesical space is provided. A small prevesical tube, retained as long as the bladder drain, does not delay healing and safeguards against pelvic cellulitis. Further, I have found that the infection of the bladder and prostate in drainage by catheter is due to ascending infection alongside the catheter and along its lumen, and can be prevented by careful dressing of the glans penis with iodoform gauze soaked in glycerin, dressing the end of the catheter with an antiseptic dressing, and instructing the nurses in the elements of antiseptic work in bladder surgery.—J. T.-W.]

N. G. Hale<sup>8</sup> reviews a series of 71 cases of *enlargement of the prostate*: 40 were submitted to suprapubic, and 28 to perineal, prostatectomy, while the remaining 3 died before operation could be performed. He emphasizes the importance of pre-operative treatment, especially bladder drainage, for which he prefers the in-dwelling catheter. Of his 40 suprapubic operations, 7 only were performed in two stages, 4 of the 7 because of failure of the retained catheter to drain the bladder properly. Of the 71 cases, 66 were benign and 5 malignant, as judged by clinical examination; the post-operative microscopic examination, however, showed 59 to be benign and 12 to be malignant. The writer does not clearly indicate his personal preference for either the suprapubic or the perineal route. He concludes that the type of operative procedure carried out will have a similar end-result whichever route is chosen; but considers that the logical operative procedure is via the perineum, provided that a method of operation by this route can be perfected so that enucleation of the prostate is complete, and the greater danger of serious injury to the perineal muscles is obviated. As regards the perineal operation, he prefers Hinman's technique to that of Young.

T. Katz<sup>9</sup> discusses the factors that have contributed to the *improvement in the operative results of prostatectomy*. The pre-operative preparation made in his cases consists in disinfection of the urinary tract by the oral administration of **Salol**, **Urotropine**, or **Methylene Blue**; stimulation of the heart; and in nearly all cases double vasectomy to control epididymitis. Double vasectomy is also performed in cases in which the radical operation must be refused, as for example in patients with arteriosclerosis who have had attacks of apoplexy, patients with advanced chronic myocarditis, and fat patients with a rapid pulse and low blood-pressure. The mortality in the 452 cases in which he has performed prostatectomy since 1920 was 3.4 per cent, and there was no post-operative hæmorrhage, uræmia, or pneumonia. With regard to the operative technique Katz lays great stress on the importance of hæmostasis by suture and ligature during the operation.

G. G. Smith<sup>10</sup> compares the results of *suprapubic prostatectomy and perineal prostatectomy* in his hands, as regards mortality, duration of stay in hospital, and functional results. The comparison is based upon 100 cases submitted to each method of operation. Of the suprapubic cases, 5 died after cystotomy. Of 16 operated upon in one stage, 3 died, a mortality of 19 per cent. Of 79 cases operated upon in two stages, 9 died, a mortality of 11 per cent. The total mortality in the suprapubic group was therefore 17 per cent. Of 100 perineal cases, 3 died. The average stay in the hospital for the suprapubic cases which survived operation was 41.5 days for the one-stage cases and 52 days for the two-stage. The average stay in hospital for the perineal cases was 39 days. The writer states that as regards functional results those following the suprapubic operation were somewhat better than those following the perineal, but this difference was in his opinion not sufficient to counterbalance the much lower mortality of the perineal group.

C. S. Swan<sup>11</sup> reports a series of 54 consecutive cases of *suprapubic prostatectomy*, 4 of which died. Taking the 50 patients who survived, he contrasts the post-operative course of the 23 submitted to an operation in one stage with that of the 27 who were treated in two stages. His statistics show that one-stage cases are healed in from one to three days earlier than the two-stage, and he concludes by stating that the patient who is about to have prostatectomy performed may expect to have to undergo a period before operation of from eight to forty-five days' preliminary drainage, depending upon how soon he can attain the standard of health necessary for a one-stage operation. He may then expect a period of from three to six weeks for healing

to take place, although he has at least a 33½ per cent chance of healing in less than three weeks. From his entry to hospital to discharge therefrom he may count on remaining about five weeks if undergoing a one-stage operation, or ten weeks if his operation is to be performed in two stages. He must take the chance of a mortality percentage that varies from about 3 to 10, in this particular series 7·4 per cent. During the past decade the mortality for suprapubic prostatectomy has been greatly reduced, and in the writer's opinion a given patient treated with adequate precaution has an 85 per cent chance of gaining a perfect functional result.

A prolonged discussion on the *technique and results of prostatectomy* held by the Section of Urology of the Royal Society of Medicine, London, in May, 1931, was opened by Kenneth Walker,<sup>12</sup> who drew attention to the difference of opinion in existence on the various practical points which arise in the treatment of prostatic cases. Some seventeen members of the Section took part, and among other points the following were emphasized. It is impossible to bestow too much care on the pre-operative treatment of patients before contemplating prostatectomy, and such treatment may necessitate careful decompression of the urinary tract by urethral catheter or suprapubic drainage of the bladder, regulated by the making of periodic renal function tests, for the restoration of impaired renal function, and irrigations for the treatment of sepsis. The administration of suitable sedatives at night to give sleep, and rectal salines and glucose by day to provide for fluid intake, in addition to such general measures as care of the bowels, regulation of the diet, and the administration of urinary antiseptics, were all of the utmost importance. The chief dangers of the operation are hæmorrhage, sepsis, and post-operative obstruction. As regards the actual technique of the operation of prostatectomy, the suprapubic route was the one of choice, and a general consensus of opinion favoured the open operation of Thomson-Walker whenever the circumstances of the patient's condition permitted its adoption. In short, if the experience of the operator, the condition of the patient, and the facilities for after-treatment justified it, a one-stage prostatectomy by the open method, as opposed to the blind method introduced by Freyer or by the perineal route, was advocated by the majority of those present. Thus the type of operation should be adapted to the conditions obtaining in each individual case. It was agreed that hæmostasis should be achieved as completely as possible before the patient left the operating table. This may be done by suture, ligature, packing, or the insertion of a hæmostatic bag under direct vision after enucleation of the gland and the removal of redundant tags from the walls of the prostatic cavity, together with, if necessary, the removal of a V-shaped portion of the tissues forming the posterior margin of this cavity. Minor differences of opinion were shown as to the relative values of the above methods of obtaining hæmostasis.

The question whether or not a urethral catheter should be inserted at the time of operation and tied in was the subject of considerable variation of opinion. In Thomson-Walker's hands this procedure is an important part of his technique of after-treatment, not for drainage, but to allow, if necessary, of easy packing of the prostatic cavity, and to allow of continuous irrigation should this be thought advisable. Whenever packing of the prostatic cavity with gauze or the insertion of hæmostatic bags was carried out, it was agreed that such foreign bodies should be removed, if possible, within forty-eight hours after the operation, owing to the tendency to septic infection of the prostatic cavity. Several speakers strongly advocated section, and ligature of the cut ends, of both vasa deferentia before the patient left the table in order to prevent epididymitis.

Post-operative treatment was the subject of much discussion, and it was in connection with this that the greatest variation of opinion was apparent. The opener considered that the discussion had served its purpose in showing how much surgeons vary in opinion and practice, and that if any moral were to be drawn it was that the operation must be regulated to the patient's needs.

H. H. Young,<sup>13</sup> at a meeting of the Section of Urology at the Royal Society of Medicine, London, pointed out certain advantages which the *perineal route* of approach appeared to offer, not only in operations for benign hypertrophy of the prostate, but also for carcinoma of the gland, for tuberculosis of the prostate and seminal vesicles, and for rarer conditions such as retention cysts of the prostate, diverticula of the posterior urethra, rupture of the posterior urethra, certain cases of post-operative incontinence of urine, recto-urethral fistulae, and certain cases of impermeable stricture of the urethra. He described his technique in detail, laying emphasis on the advantage he has derived from the use of sacral anaesthesia by the injection of 20 c.c. of 3 per cent procain into the sacral canal, which gave excellent relaxation and was suitable for patients unfit for general anaesthesia. He also emphasized the great importance in perineal surgery of having the patient in the optimum position with the perineum well elevated.

He enumerated the causes of death in a series of 1571 cases of perineal prostatectomy performed with a mortality of 3.6 per cent. Of the 59 deaths, 15 were due to pneumonia, 7 to uraemia, 7 to pulmonary embolism, 7 to sepsis, 5 to heart disease, 3 to cerebral haemorrhage, 2 to acute pulmonary oedema, 2 to cerebral thrombosis, and 2 to haemorrhage. The remaining 9 patients died from causes not directly relating to the operative procedure.

**Prostatic Calculi.**—J. P. Grinda<sup>14</sup> discusses calculi of the prostate under the three commonly recognized forms, namely: (1) Calculi of the prostatic urethra; (2) Calculi in pockets communicating with the urethra; and (3) True prostatic calculi buried in the gland substance. Treatment is operative. The suprapubic route of approach is to be preferred, and owing to the probability of recurrence complete prostatectomy by dissection is desirable.

REFERENCES.—<sup>1</sup>*Amer. Jour. Surg.* 1931, Feb., 334; <sup>2</sup>*Ibid.* 1930, Sept., 507; <sup>3</sup>*Brit. Med. Jour.* 1931, i, 482; <sup>4</sup>*New Eng. Jour. Med.* 1930, Nov. 13, 959; <sup>5</sup>*Ann. of Surg.* 1931, Jan., 326; <sup>6</sup>*Lancet*, 1931, i, 957; <sup>7</sup>*New Eng. Jour. Med.* 1930, April, 906; <sup>8</sup>*Calif. and Western Med.* 1931, March, 158; <sup>9</sup>*Jour. d'Urol.* 1930, May, 473; <sup>10</sup>*New Eng. Jour. Med.* 1930, July 17, 114; <sup>11</sup>*Ibid.* Oct. 9, 716; <sup>12</sup>*Proc. Roy. Soc. Med.* 1930, July, 1289; <sup>13</sup>*Ibid.* Oct., 1689; <sup>14</sup>*Jour. d'Urol.* 1930, Sept., 225.

**PSORIASIS, PUSTULAR.** (See ACRODERMATITIS CONTINUA VEL PERSTANS.)

## PSYCHONEUROSES: CAUSATION AND TREATMENT.

Henry Devine, M.D., F.R.C.P.

In an article on *neurasthenia as an emotional reaction* H. J. Darmstadter<sup>1</sup> points out that the tremendous frequency of functional nervous disorders makes it impossible to relegate all such cases to the neuropsychiatrist's field, and that the treatment of this great class of patients is a responsibility that rests chiefly with the general practitioner. It is he whom the patient first consults, and it is he, by virtue of his early contact, who is able best to terminate many of the commoner, simpler types of neurosis. It is especially neurasthenia in the sense of the 'irritable weakness' of Beard—a state in which fatigue, irritability, and symptoms resembling visceral disease are prominent, and in which there is a degree of suffering and anxiety not explicable by obvious findings—that the practitioner is well able to treat if the origin of these symptoms is understood. Such cases can be interpreted, the writer feels, without an intimate knowledge of the vagaries of the erotic impulse and

of their symbolic manifestations which is the basis of the psycho-analytic method. These conditions are explicable on general biological knowledge based largely upon experimental observations. The work of Cannon upon the physical changes in various emotions, and that of Pavlov upon the conditioned reflex, are basic to the biological conception of these neurasthenic cases. The core of this conception is the biological fact that definite alterations in function accompany emotional states. That palpitation, lump in the throat, flushing, pallor, tremor, dizziness, dyspnoea, nausea, vomiting, faintness, sweating, and importunate calls to bladder and bowel evacuation, may occur in emotional disturbance is common knowledge, but the correlation of these with the symptoms of neurasthenia and anxiety states is an important step towards an understanding of these conditions.

In the study of emotional reactions it has to be appreciated that an emotional state is the awareness of bodily changes, and that each emotion is recognizable by its specific pattern of sensations. Fundamentally, and especially as we observe them in animals, emotional reactions are of vital utility. The physical changes that characterize emotions appear whenever the stimulus is such as to require a more vigorous response than usual. In animals emotional reactions have a definite utilitarian origin, but in man these responses have not the same utility. The reason is obvious. The things that frighten animals are grossly material—an enemy or some other threat to life. Moreover, animals, since they cannot forecast the future, react emotionally to present perils. Against such dangers the flight reaction is adequate. Civilized man rarely encounters hazards of this kind. His dreads are of disease, poverty, disgrace, the supernatural, and—more subtly persuasive than all—his own faults and incapacities. Against such dangers as these a response that serves only to accelerate and intensify motor activity must be worthless. Nevertheless it persists. The utility that it possessed throughout long ages of primitive life has caused it to be formulated with a rigidity upon which the changed conditions of our own era have made not the slightest impression. That the response is the same whether we face a stock-market catastrophe, an armed highwayman, or the necessity of a surgical operation, is a measure of the emotional misfortune that we suffer. The very complexity and diverseness of our dangers have forced us to delay response until the most suitable course of action may be selected. In this we have the basis of reason. But if this response has fallen into a desuetude, it can hardly be called an innocuous one. The feeling of fear remains, in some degree, inseparable from every perception that even remotely suggests an injury to some aspect of our well-being. Moreover, it may be attached to anything, itself emotionally indifferent, that is associated with some painful memory. When such innocent associations recur in consciousness they may bear the whole burden of the emotional distress without the appearance of the real painful memory in consciousness. This is a manifestation of the conditioned reflex as illustrated in Pavlov's experiments. Such a mechanism is at the basis of innumerable instances in both normal and neurotic where an emotion is felt in the absence of an adequate cause. Intelligently introspective individuals, by reviewing the circumstances surrounding such an occurrence, can often recall a connection with some affect-bearing memory, and a large part of the work of the psychopathologist is concerned with resynthesizing such associations.

The conditioning of responses explains the appearance of emotional manifestations (which, according to Darmstadter's theory, are identical with the symptoms of neurasthenia) in the absence of an obvious cause. The neurotic does not recognize the emotion itself as a feature of his disease, since the somatic sensations of the emotion appear without obvious cause, and, being



thus inexplicable, they command attention as unusual, and are capable of being interpreted as evidence of an organic ailment. Conversely, if the neurasthenic were to understand that his symptoms are essentially those of protracted fear, and if he were to discover a cause, he would automatically cease to regard himself as ill. The failure to recognize the cause for an emotion is due to several factors. The stimulus is often an unpleasant complex of ideas only vaguely formulated. Such complexes may be so customary by reason of their long durations, and so intangible by reason of their diffuseness, as to be devoid of vividness. It is this very characteristic which enables them to permeate without detection the entire mental life with their unhappy implication. They constitute the almost imperceptible but persistent nagging emotional traumata that underlie so many deeply seated neuroses. This is particularly descriptive of the inferiority complex. A failure in some minor effort may evoke the emotional depression of a complex that has been built up of all the failures and disappointments of a lifetime. It is like a spark that detonates a vast hidden storehouse. The unit experiences in a series of traumata may be too trivial, individually, to make a lasting impression on consciousness. Since the total complex is the abstract summation of these units it is not surprising that it escapes recognition. It appears, then, that the position of a complex in the unconscious realm does not always depend on active repression. The repressed, unadmitted fear of disease, such as fears of syphilis, cancer, or heart disease, are extremely prevalent and productive of much agitation and depression. In such cases the patient does not admit his fears to the doctor or to himself, but complains of minor symptoms simulating organic disturbance which are the expression of repressed and protracted fear, the origin of which the patient refuses to admit or recognize.

Symptoms simulating organic disease resulting from protracted emotions are not the only manifestations of neurasthenia. These include the peculiar fatigue so characteristic of this neurosis, and certain symptoms commonly recognized as 'nervous'—confusion, irritability, lack of concentration, insomnia, poor memory, and so forth. These symptoms are the expression of anxiety which is the equivalent of fear with the modification of uncertainty and incomplete consciousness of the offending stimulus. Such symptoms are the expression of conflicts between opposing desires (such, for instance, as the conflict between the erotic impulse and social impulses which inhibit its gratification), and these are capable of indefinite prolongation. The dilemma of uncertainty in such cases wages back and forth like a battle, and its devastating effect depends upon the insidious bombardment of minute emotional injuries and the expenditure of mental effort upon the unavailing struggle. The attendant uncertainty gives rise to a ceaseless mental struggle to solve a problem even the nature of which is not clearly known. The futile back-and-forth play of thought pre-empt the field of attention, and renders all else unimportant and without interest. The disinclination for ordinary activities is interpreted as *fatigue*, while the intellectual disinterest leads to failure of concentration, and hence of memory. *Tremor* and *restlessness* are the motor manifestations of uncertainty of purpose and lack of mental repose. Such manifestations are felt as transient episodes by normal people when facing consciously a complicated or baffling problem. It is only when the cause for these disturbances is unknown that they are interpreted as abnormal.

G. A. Moleen<sup>2</sup> writes on the *influence of emotional shock on the gastro-intestinal tract in the psychoneuroses*. Various experiments have shown that emotional stimuli inhibit the secretory activity of the glands of the stomach, duodenum, pancreas, and liver; produce effects on the involuntary muscles of the gastro-intestinal tract—contractions, 'hour glass' stomach; and modification of the

chyme, biliary, and pancreatic outflow. Interesting in this connection is the case described by Cannon of the woman who, at her first examination, appeared to have no gastric juices, but who on subsequent tests was found to have plenty. It was then learned that on the night preceding the making of the first analysis she had been kept awake by the conduct of her husband, who had chosen the occasion to get uproariously drunk. The influence of emotions on the secretory structures varies in different individuals, at times being more manifest in the salivary or gastric secretions than in the pancreatic or intestinal, or vice versa. It is probable that in the majority of susceptible psychoneurotics the alteration in the chyme as well as that of the pancreatic juice is chiefly responsible for the flatulence and gaseous distension which is so frequently a cause for complaint in these patients. Not only is the secretion of the pancreas inhibited and the volume consequently diminished, but its enzymotic content is also diminished or altered. That the flow of bile through the common bile-duct exerts an exciting influence on the outlet of the duct of Wirsung, with a stimulating effect on the flow of pancreatic juice, is generally conceded; indeed, with all the factors that may influence the pancreatic secretion in amount and constituents growing out of the effect of the emotions, it would indeed be surprising if complaints from the gastro-intestinal tract were not forthcoming.

The alteration in the metabolism of fats as a result of inhibited secretory activity is probably the most important factor in the development of the distressing intestinal disturbances so frequently accompanying functional nervous states. The faulty metabolism of fats often results in the overproduction of fatty acids—possibly in part due to limited saponification as well as to lipase deficiency; this is responsible for the intestinal irritative reaction as a result of the change from the normal alkalinity, as well as the familiar manifestations of acidosis so frequently encountered. Moleen states that it is quite possible that such disturbance plays an important part in the development of ulcer, especially if the way has been prepared by an alteration of the chyme because of the gastric glandular inhibition or suppression proceeding from the same general influence. Similar distressing symptoms may be attributed to the lessened amylolytic and proteolytic enzyme content of the pancreatic fluid.

G. R. Reynolds<sup>3</sup> writes on the *etiology of psychoneuroses encountered in the practice of internal medicine*. The writer states that in a series of 935 unselected medical cases, 200, or 21 per cent, were diagnosed as psychoneuroses. When classified from the etiological point of view five main groups were differentiated, the most prominent factor being selected in each case. These five divisions were as follows: (1) Cases in which the *sexual life* of the patient seemed to have been the etiological factor; (2) Instances in which the *environment* was considered an adequate basis for the neurosis; (3) The so-called '*fatigue neuroses*'; (4) Cases in which the patient appeared to have had throughout life such an *unstable nervous equilibrium* that the most trivial addition to the strain of daily life would produce a psychoneurotic state; (5) Those in which the neurosis seemed to be the result of some *organic physical disability*.

It is the last group to which the author devotes special consideration, for, as he observes, from the point of view of the practitioner of medicine, those cases with a background of physical disability would seem to be the most important of all the neuroses, since their treatment falls into his province rather than that of the psychiatrist. Moreover, patients with known physical disability usually fail to recognize the neurotic elements in their symptomatology, and therefore are not willing to go to the psychiatrist for treatment. Nor should they do so if an internist is available who will take into consideration, and treat, the neurotic factor simultaneously with the organic element. The

difficulty is that the practitioner is in danger of becoming too absorbed in the treatment of any obvious organic pathological condition he may discover to pay attention to the neurotic symptoms which are its result. On the other hand, if the neurotic element is predominant, it is equally easy to overlook the apparently trivial physical abnormalities which may have been contributing factors in the disturbance of the nervous equilibrium. In order to steer a middle course between these two common errors, it is well to assume that every case has a functional and an organic element. Organic disease may produce a psychoneurotic state in various ways: (1) A neurosis may be developed as the result of a constant fear of impending disaster, e.g., patients with markedly high blood-pressure. (2) Individuals after a prolonged convalescence from an acute illness may be so nervously exhausted as to make the neurotic element of as great importance as the purely physical aspect of the case—or even greater. The same is true of patients who have suffered from months of pain and disability due to some chronic affection such as arthritis. (3) Physiological changes of the menopause almost always affect the nervous equilibrium to a greater or lesser extent. (4) Twenty-six of the writer's cases are classified under the heading of 'malnutrition'. Though these patients complained of symptoms obviously of neurotic origin, all of them gave a history of physical fatigue for some months before the origin of the neurosis, most of them had been for some time on a diet deficient in protein or some other essential food, and a surprisingly large proportion showed a mild secondary anaemia of the type responding well to dietary measures. Furthermore, *all* these cases showed a marked and rapid improvement in their neurotic symptoms *when, and only when*, they had been on a proper régime of rest and diet for a few weeks, and the anaemia, if present, had been eliminated. Below is a tabulation of Reynolds's cases in which various physical abnormalities were found in association with the psychoneuroses:—

PHYSICAL FACTORS ASSOCIATED WITH NEUROSES  
(SYMPTOMATIC OR ETIOLOGICAL).

Gastro-intestinal neurosis .. ..	23
Mucous colitis .. ..	4
	— 27
Malnutrition .. ..	26
Cardiac disorders:	
Hypertension .. ..	10
Paroxysmal tachycardia .. ..	3
Effort syndrome .. ..	2
Cardiac insufficiency .. ..	2
Palpitation .. ..	2
	— 19
Chronic arthritis .. ..	7
Secondary anaemia .. ..	6
Pelvic disorders .. ..	5
Hyperthyroidism .. ..	4
Menopause .. ..	4
Angioneurotic oedema .. ..	2
Hysterical paralysis .. ..	2
Spasmodic torticollis .. ..	1
Total .. ..	103

In some of the cases it will be seen that the physical disorders are manifestations of the psychoneurotic state, whilst others are definitely organic phenomena, but may be regarded as etiological factors in the production of the neurosis. No attempt has been made to separate the two types, and they are simply listed in order to show those physical conditions, in this series, which seemed to have a definite relation to psychoneurosis.

J. M. Berkman<sup>1</sup> at the Mayo Clinic has made a study of 117 cases, fundamentally alike clinically and diagnosed as *anorexia nervosa*, especially in respect of the metabolic rate. The conclusions reached by the writer are as follows: (1) *Anorexia nervosa* may be said to constitute a definite clinical entity. Briefly, its clinical characteristics are anorexia, emaciation, various gastrointestinal disturbances, marked nervous manifestations, and low basal metabolic rate. The condition is not very common; 137 cases were diagnosed at the Mayo Clinic in thirteen years. (2) It seems probable that the low basal metabolic rate is the result of inanition. (3) The absence of any pathologic change characterizes the condition as a physiologic disorder secondary to a psychic disturbance. (4) The re-establishment of normal intake of calories is the direct goal, and to this end treatment with a preparation of **Thyroid Gland** has proved to be a valuable adjunctive measure.

REFERENCES.—<sup>1</sup>*Amer. Jour. Med. Sci.* 1931, March, 323; <sup>2</sup>*Jour. Amer. Med. Assoc.* 1930, Sept. 27, 910; <sup>3</sup>*New Eng. Jour. Med.* 1930, Aug. 14, 312; <sup>4</sup>*Amer. Jour. Med. Sci.* 1930, Sept., 411.

**PSYCHOPATHOLOGY OF CHILDHOOD.** (See CHILDHOOD, PSYCHOPATHOLOGY OF.)

**PSYCHOSES.** (See MENTAL DISEASES.)

**PULMONARY AFFECTIONS.** (See ECHINOCOCCAL CYSTS OF THE LUNG; INTRATHORACIC NEW GROWTHS; LUNG, ABSCESS OF; PNEUMONIA; PNEUMONOCOCCUSES; TUBERCULOSIS, PULMONARY.)

**PURPURA (The Hæmorrhagic Diathesis).**

*Stanley Davidson, M.D., F.R.C.P.E.*

Purpura is a symptom and not a disease, and it is therefore easy to understand the difficulty which all workers have found in establishing a satisfactory classification of the different clinical types. Considerable doubt still exists as to the rôle of the blood-platelet in the pathogenesis of purpura; and, further, if its importance is admitted, the problem whether the thrombocytopenia is due to defective formation in the bone-marrow or excessive destruction in the spleen, cannot be said to be settled. Modern opinion has strongly veered round to the view that in the majority of cases of purpura the blood-platelet is at most a factor of secondary importance, and the fundamental defect is to be found in the capillary wall. These views are based on a careful study of many cases of severe purpura with no reduction in the numbers of circulating platelets, as well as cases of severe thrombocytopenia with no evidence of bleeding. W. Mackay,<sup>1</sup> in an excellent paper, reviews the literature dealing with the blood-platelet, and deals with a hæmatological investigation of six healthy persons and 74 patients suffering from various diseases. The author adduces strong evidence in support of the thesis that the all-important factor in controlling capillary hæmorrhage is not the number of blood-platelets but the ability of the capillary wall to contract.

S. C. Dyke and W. Stewart<sup>2</sup> publish observations on the blood-platelets in pernicious anæmia, which demonstrate a fact already well recognized, that in the relapse state a considerable thrombocytopenia may be found. In one case the platelet-count fell to 17,000 per cubic millimetre of blood, and yet there was no tendency towards hæmorrhagic manifestations.

H. L. Tidy,<sup>3</sup> in an address on the symptoms and pathogenesis of the hæmorrhagic diathesis, states that the hæmorrhages are primarily due to increased permeability of the capillary endothelium. Blood-platelets normally protect the capillary endothelium, and the diminution in number observed in purpura

is secondary to this action. Escape of plasma through the endothelium will occur before or at the same time as the escape of erythrocytes, and accounts for certain symptoms, such as wheals, arthritis, and especially abdominal colic. Harry Coke<sup>1</sup> believes that the central factor in purpura is toxæmia secondary to infection, particularly in the throat and usually by the hæmolytic streptococcus, which injures the capillary endothelium so that micro-traumata cause a rupture resulting in an escape of blood. In support of this thesis he describes in detail two interesting cases of purpura.

*Arsenobenzol Purpura.*—J. Bamforth and J. St. C. Elkington<sup>5</sup> report four cases of arsenobenzol purpura in patients under treatment for syphilis. They point out that they can find only fifteen similar cases in the literature, in spite of the fact that thousands of cases are treated annually with arsenical compounds. The purpura is undoubtedly a toxic manifestation and is secondary to the essential underlying factor of aplasia of the bone-marrow. The quantity of the arsenobenzol compounds administered, and the period of time over which they were given, do not appear to differ from those successfully applied in many thousands of cases, so that the toxic manifestations must be attributed to an idiosyncrasy on the part of the patient rather than to excessive or over-energetic therapy.

**TREATMENT.**—The spontaneous remissions and cures which are so characteristic of many cases of purpura make it very difficult to assess the value of any form of treatment. Many authors have published reports on the value of liver in the treatment of thrombocytopenic purpura, but L. J. Witts<sup>6</sup> rightly points out that most of these publications are based on individual acute cases and are therefore valueless. In a very carefully controlled investigation of five chronic cases the author has clearly shown that liver therapy has no appreciable effect whatsoever. Calcium therapy has little to recommend it, since the coagulation time in purpura is little altered. The numerous patent hæmostatics on the market have failed to be of real value in cases subjected to critical analysis. Intravenous injection of **Adrenalin Hydrochloride**, 1-1000 in solution, as recommended by Gibson in the treatment of aplastic anæmia, has been known to check hæmorrhage in children, and this line of treatment deserves further investigation.

All remedies reported are recognized to be practically valueless for the treatment of severe hæmorrhage, in comparison with the effects produced by **Blood Transfusion**. If blood transfusion fails to check hæmorrhage, no other line of treatment can have any possible chance of success, and the patient will die. In many cases complete cessation of bleeding may occur for months, or even years, after this procedure, but in other cases it is necessary to consider in addition the advisability of **Splenectomy**. Unless one believes that the essential cause of purpura is platelet destruction resulting from hyperactivity of the spleen, it is difficult to understand the rationale for this operation.

A. P. Vastola,<sup>7</sup> in a recent paper, claims dramatic results from a combination of operation and repeated transfusions, and he is at least consistent in advocating in practice what he believes to be sound in theory—namely, that the spleen is the essential factor in the causation of purpura. It must, however, be candidly admitted that certain valid objections to the operation exist. In the first place, the procedure is attended with a high mortality risk. Next, the spleen in the majority of cases of severe acute purpura is not enlarged. Pathological opinion is in favour of the view that histologic examination of the spleen removed at operation reveals no feature which can be called pathognomonic of purpura. Spleen enlargement, when it occurs, may well be due to the primary condition which has led to the purpura. Again, while a considerable rise in the platelet-count is to be expected after splenectomy,

this is not specific, since it occurs after all major operations. And lastly, even after successful operation, hemorrhage may not cease, or only cease temporarily. On the other hand, dramatic results have undoubtedly followed the operation in desperately ill cases in which the prognosis appeared to be well-nigh hopeless, and in consequence the possibility of operation must be seriously considered in certain cases. A chronic, moderately severe case of the hemorrhagic diathesis, in which the condition shows little evidence of progression and the disability is not so serious as to prohibit the patient's living a fairly normal life, should not be subjected to this serious risk. On the other hand, if the patient is severely anæmic and blood transfusion is found to be ineffectual in producing more than temporary improvement, splenectomy should be undertaken. Tidy very wisely points out that two facts in the blood picture are of real value in helping to form a decision: (1) If the white count is low, this is suggestive of some degree of bone-marrow aplasia being already present, secondary to the long-continued drain, and is an indication in favour of operation. (2) Unless the platelet-count is well below normal, it is unwise to operate, since the great increase of platelets which follows is liable to cause venous thrombosis.

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### PYELITIS AND PYELONEPHRITIS.

S. W. Patterson, M.D., D.Sc., M.R.C.P.

Infections of the urinary tract with colon bacilli are common, the usual source being the intestine (entero-renal syndrome). Intestinal infection, when it is complicated, is especially liable to extend to two organs: the gall-bladder, setting up infective cholecystitis, and the urinary tract, giving rise to pyelitis and cystitis. Of the intestinal affections, those showing signs of irritation of the mucous membrane—colitis, chronic diarrhoea, diverticulitis—seem more prone to give rise to urinary infection than atonic states of the colon with simple constipation. C. P. Mathé,<sup>1</sup> reviewing 347 cases of pyelonephritis, includes among the causes, besides intestinal stasis (entero-renal syndrome), foci of infection in teeth and tonsils, paranasal sinuses, prostate, Fallopian tubes, uterine cervix, and respiratory tract. Urinary stasis may also contribute; it may be secondary to stone in the kidney, ureteral stones or strictures, undue mobility of the kidney, pressure on the ureter by an aberrant blood-vessel, adherent bands, or a foetus; or to valve obstructions in the posterior urethra, urethral stricture, hypertrophy of the prostate, bladder stones, or neurological defects in the neck of the bladder. As a rule, restoration of the anatomical integrity of the urinary tract is sufficient to put an end to the infection.

C. Lepoutre<sup>2</sup> deals with cases which present no gross changes requiring treatment, and discusses in detail the various medical treatments that are employed, together with their special indications. Alkalization gives excellent results. **Sodium Bicarbonate** in large doses usually greatly relieves the general symptoms. Potassium salts may provoke diarrhoea. Of the urinary antiseptics, **Urotropine** is most effective; it should be combined with phosphoric acid or sodium benzoate, as it acts only in an acid urine. As a rule, the dose should not exceed 2 grm. (30 gr.) a day, though urologists use as much as 8 grm. (2 drachms) a day. Urotropine may be given intravenously, as may certain dyes—**Acriflavine** and **Mercurochrome**. **Neo-arsphenamine** (0.15 to 0.30 grm. given intravenously every five or six days) has been used with success. For oral medication, **Colloidal Silver Preparations**, **Methylene Blue**, **Caprocol**, **Pyridium**, and **Methenamine** have been used to advantage.

R. Gutzeit<sup>3</sup> recommends **Uricedin** in doses of one or two teaspoonfuls well diluted two or three times a day. **Lavage of the Bladder** favourably affects pyelitis by provoking a reflex contraction of the renal pelvis and ureter. A tepid solution of water or boric acid is injected very slowly through a soft rubber catheter until discomfort is felt. After a few minutes the catheter is removed and the patient allowed to urinate. Except in pyelitis of pregnancy the effects are favourable. Lavage of the renal pelvis gives excellent results. A retention **Ureteral Catheter** may be used in certain circumstances, notably in pyelitis of pregnancy. The catheter should be changed about every three days. Other solutions may be used, **Silver Nitrate**, **Mercurochrome**, **Acriflavine**, and **Acid Fuchsin**.

Discussing the use of **Sera**, Lepoutre<sup>2</sup> reports excellent results with a serum prepared by injecting horses with colon bacilli of urinary origin. The serum is injected both subcutaneously and directly into the pelvis of the kidney. Vaccines in his experience are of little use. Non-specific shock has been effected by vaccines, electargol, peptone, milk, blood, and sterile pus without results of value. Benefit has followed the use of **Bacteriophage**, of which a strain must be employed which is adapted to the invading organism. From 2 to 3 c.c. are injected subcutaneously every other day up to a maximum of four doses. At the same time from 10 to 20 c.c. are given by mouth, and a like amount is injected into the bladder, to be retained as long as possible. The urine should be kept alkaline and no antiseptics given.

R. Jahiel and J. Petetin<sup>4</sup> note that the subjects of pyelitis complain most of cystitis, which tends to run a chronic course with acute phases. In their experience a common symptom is hæmaturia, often considerable. The treatment they adopt is based upon the principle of local vaccination advocated by Besredka. Autogenous **Vaccines** are prepared, and the bladder is injected with filtrates of ten-day cultures in broth. Local vaccination of the source of infection, the intestine, is also carried out, 10 c.c. of a bacterial emulsion being given daily on an empty stomach. A simple diet is taken, and drastic aperients are avoided by using paraffin preparations as required. The authors have treated fifty cases; and of these most were considerably better.

To sum up, in the management of various forms of pyelitis and pyelonephritis, local treatment by ureteral catheterization occupies a prominent place, especially in cases in which there is evidence of retention, with high fever. Of the biological agents, *B. coli* serum and vaccination with bacteriophage are recommended. The surgical measures employed include drainage of the kidney, decapsulation, nephropexy, and nephrectomy.

REFERENCES.—<sup>1</sup>*Jour. of Urol.* 1930, xxiv, 119; <sup>2</sup>*Arch. des Mal. des Reins*, 1930, iv, 624; <sup>3</sup>*Münch. med. Woch.* 1931, May 22, 886; <sup>4</sup>*Presse méd.* 1930, Oct., 1326.

## PYREXIA, CONTINUED: AND THE DIAGNOSIS OF SOME OF ITS CAUSES.

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Cases of continued pyrexia may be classified in various ways; for the purposes of this article they may first be subdivided into two main groups, namely:—

*Group I.*—Those cases in which health has been good up to the onset, whilst the pyrexial illness is severe enough to make the patient ready to stop in bed spontaneously.

*Group II.*—Those cases in which previous health may have been good or indifferent, whilst the general state of the patient when the existence of pyrexia has been discovered may be such that, though he feels poorly, he may resent being kept in bed.

There are cases, of course, that cannot be placed forthwith into the one or

the other group; and others which belong to *Group II* at one phase of the illness and merge into *Group I* with rapidity, especially as regards willingness to stay in bed; but the distinction serves for purposes of discussion.

#### GROUP I.

*Group I* absorbs most cases of—

Typhoid fever	Encephalitis
Paratyphoid fevers A, B, C	Psittacosis
Typhus fever	Mediterranean or Malta fever
Meningitis	Influenza
Relapsing fever	Tetragenus fever
Various tropical fevers	Leptothrix fever
Trench fever	

**Typhoid and the Paratyphoid Fevers** are suggested when the pulse-rate is definitely slow relatively to the temperature, a feature which is often pronounced; the small rose-spots on the abdomen, each free from any central punctum, may be only two or three in number at the end of the first week and later, but when recognized they are by themselves almost diagnostic; one expects the spleen to be palpable, the blood-count to show a relative rise in the lymphocytes without leucocytosis; and the rest of the examination to be negative until the Widal reaction becomes positive later in the illness—often not before the end of the second week or even later. Frequently there are a few râles or rhonchi in the chest, and if these are many one may suspect the illness to be pulmonary; indeed, there is a frankly pneumonic form of typhoid in which the enteric nature of the illness will be missed if the Widal reaction is not tested and repeated; but the pneumonic type is rare, and those cases which may be thought at first to be typhoid fever yet ultimately turn out to be pulmonary tuberculosis of caseous bronchopneumonic type are a source of difficulty which defeats us all until we have been given time to watch the course the case is running. The lymphocytosis without increase in the total leucocyte count serves to exclude another difficulty, namely deep-seated pus-formation, such as a pyosalpinx or an empyema of the gall-bladder, for with these one expects the total leucocytes to be increased, with particular relative rise in the polymorphonuclear cells. Typhoid fever very seldom gives rise to a rigor, unless in a late stage, when there may have been some complication such as gall-bladder infection or phlebitis; a rigor earlier should make one chary of keeping typhoid fever uppermost in one's mind. Headache may be extreme in typhoid fever from the start, for the first week; it then disappears entirely in a way that is not the case with meningitis; for a time, nevertheless, some forms of meningitis may be confused with typhoid; the spleen does not enlarge, however; a convulsion renders typhoid very unlikely; toward the end of the second week optic neuritis may give the diagnosis, and occasionally a choroidal tubercle may be seen even earlier. Lumbar puncture and the state of the cerebrospinal fluid as regards its pressure, cytological contents, and chemical analysis may be resorted to, but personally I deprecate lumbar puncturing patients unless there are clear and definite reasons for so doing in the particular case. Infective endocarditis may be confused with typhoid fever very easily sometimes; either when the patient already has a bruit and then develops the pyrexia and enlarged spleen of typhoid fever, or when there is not yet a bruit from the cardiac lesion and the pyrexia and the palpable spleen are thought to be typhoidal when they are worse. Blood cultures would not yet be positive as a rule in a case of infective endocarditis, but they might be in typhoid fever, and skilled bacteriologists contend that they can clinch the diagnosis of enterica by blood culture early, before the Widal reaction is yet positive.



**Psittacosis** is a severe, often fatal, pyrexial illness that has, one hopes, been eliminated by the restrictions there are on the importation of parrots: so that it merits but a brief note. There is no easy way of diagnosing it, but it suggests itself if the patient's illness resembles typhoid fever, is negative as regards Widal reactions, and occurs in a household that has recently had to do with a parrot of uncertain origin.

**Malta Fever** would suggest itself if the patient had been drinking goat's milk, or had recently returned from a district in which Malta fever is known to occur—not only the Mediterranean or Malta, but also Portugal, Spain, South-Eastern Europe, Northern Africa, or even the East. The diagnosis is proved by a blood serum test against the *Micrococcus melitensis* carried out in a way similar to that of the Widal test for the typhoids.

**Influenza** seldom gives rise to pyrexia prolonged into weeks; indeed, it only does so when there is some complication such as otitis media, infection of a frontal or other nasal sinus, phlebitis, or bronchopneumonia. It is always dangerous to label any illness 'influenza' until one has satisfied oneself in every way that it is nothing else. Many cases that have seemed to be influenza at first and then to have continued as something else, have never been influenza at all. A common example is pulmonary tuberculosis; this is again and again attributed to an origin in influenza when actually the pyrexia called 'influenza' at the start was not influenzal but tuberculous from the beginning. The 'pousses évolutives' of pulmonary tuberculosis are very apt to be mistaken for influenza. Any patient who seems unduly liable to influenza, possibly to two or three attacks in a year, should be suspected strongly of pulmonary tuberculosis, and all the appropriate steps taken to exclude the latter before one is satisfied with the label 'influenza' for his pyrexial attacks.

**Relapsing Fever** hardly ever arises in this country, though a patient may come home with it from abroad, particularly the East. The temperature chart with its recurrent periods of pronounced pyrexia is characteristic; the diagnosis is clinched by discovering the causal spirillum in a blood-drop or a blood-film.

**Leptothrix and Tetrigenus Fevers.**—Other tropical fevers will be suggested by geographical considerations. Leptothrix and tetrigenus fevers may be commoner than one thinks; short cases resemble influenza; longer, enterica. Diagnosis depends on bacteriological recovery of the leptothrix or tetrigenus germs on blood culture. Doubtless more cases of these and other temporary blood infections pass unrecognized than we know of; but most of them recover, and the accuracy of their diagnosis is perhaps rather of scientific than of practical importance.

## GROUP II.

We may now pass on to discussion of the second group of continued pyrexia cases, namely those in which, in spite of the temperature chart showing rises above the normal either continuously or at short intervals over long periods, the patient either does not feel very ill, or else, if seedy, does not feel so ill that he voluntarily stays in bed. The degree of illness is relative; some patients give in so readily that they take to bed even from slight causes; others are so hardy that even with severe illness they resent giving in; and for this reason—the varying susceptibility of individuals—the classification has no hard-and-fast line, but is used to facilitate discussion.

First, there are two possibilities from which one has to clear the ground—namely, malingering, and functional pyrexia.

**Malingering.**—The deliberate imitation of pyrexia is uncommon in civil work. During the war it was well worth while sometimes, and the tricks

adopted were many. It is difficult to heat the bulb of the thermometer by friction with blanket or handkerchief, but easy to dip the bulb into soup or a cup of hot tea. Simulated pyrexia due to causes such as these may be suspected; the way to exclude them is to stand by the patient all the time the thermometer is being used.

**Functional Pyrexia.**—This falls into a different category; the thermometer actually registers a febrile temperature however much the patient is watched. There are two types—hyperpyrexia, and continued irregular pyrexia.

The former is the easier of recognition. If a patient's thermometer occasionally records phenomenal heights such as 108° F. without the patient being obviously ill, suspicion of functional hyperpyrexia suggests itself at once. The patient is more likely to be female than male, young rather than old. There is nothing surreptitious, for the nurse may stand by all the while, and take the temperature simultaneously in mouth, armpit, groin, and rectum; the different thermometers may not record the same height of temperature, but as a rule all record something high above the likely—quite out of proportion to the rest of the condition—sometimes constantly, more often on occasions only, with normal temperatures between. The character of the hyperpyrexia suggests the diagnosis, though what there is about these patients to cause the thermometers to record these heights is little understood.

Much more difficult are cases in which mild degrees of pyrexia are recorded, and yet the feeling of the doctor in charge ultimately comes to be that the temperature records—suggestive at first of some sort of infection—are really not indicative of any disease at all; in other words, that the continued pyrexia is purely functional. My own feeling is that such a diagnosis is always dangerous, for although it may be that the microbic cause of such pyrexias is difficult to find, it is still more difficult to prove that no cause, other than neurotic, exists. Rather than call the condition 'neurotic' or 'nervous', I would surmise that there is a microbic cause—perhaps tonsillar, coli-bacilluric, glandular—needing a watch, but possibly without radical or permanent significance. I might come to regard the pyrexia as unimportant, but seldom have I cared to call it 'neurotic'.

The main difficulty is to exclude more serious causes, needing real advice and action. In most cases of continued pyrexia in which the general configuration of the illness does not bring the patient into our first group, the cause is the toxic action of some microbe acting persistently through absorption of toxins from a local focus.

In a case of continued pyrexia, not already severely ill, the probable cause lies amongst the following:—

Localized pus, including actinomycosis.

Tuberculous conditions, pulmonary, glandular, or other.

Infective non-tuberculous states, due to local infections without actual definite collection of pus: including many post-operative pyrexias.

Infective endocarditis.

Ex-tropical conditions.

Syphilis.

Head injury conditions.

Parasitic conditions.

Skin diseases.

Septicæmia.

Rat-bite fever.

Blood diseases.

Liver conditions apart from gall-bladder infection.

**Localized Pus-collection.**—Taking definite abscess-formation first, there is little difficulty about most cases of the sort; for the local abscess has often attracted local attention and local treatment before the pyrexia has become

prolonged. This applies to the majority of such states as appendicular abscess, suppurating glands in the neck, mammary or submammary abscess, mastoid abscess, subcutaneous abscess, and axillary abscess. On the other hand there are several other types of abscesses that may be by no means obvious, though they may cause prolonged fever. One would instance :—

Prostatic abscess  
Periproctal abscess  
Ischiorectal abscess  
Pyosalpinx  
Suppurating ovarian cyst  
Parametritic abscess  
Tonsillar abscess  
Retropharyngeal abscess  
Empyema of a nasal sinus  
Chronic periosteal abscess  
Chronic endosteal abscess

Dental abscess  
Hepatic abscess  
Empyema of the gall-bladder  
Buried empyema thoracis  
Subdiaphragmatic abscess  
Psoas abscess  
Diverticulitis abscess  
Actinomycotic abscess of jaw,  
cheek, neck, lung, liver, spine,  
or cæcum.

Here three things are necessary if one is to arrive at a diagnosis early : (1) To bear all the possibilities in mind ; (2) To pay the most careful attention to every word the patient tells one as to aches and pains, sorting the chaff from the wheat if the story is a long or rambling one, until amid the chaff a grain of wheat is found to guide one to the pelvis in one case, the gall-bladder in another, a frontal sinus in a third, and so on ; (3) A most careful examination of all parts of the patient in case guidance may be afforded by local tenderness over some spot in a bone, over one loin, per rectum, or elsewhere, leading one to the site of the local pus-collection.

If pus somewhere is suspected a blood-count will be helpful ; there is no likelihood of pus if the leucocytes are present in only normal numbers in the blood and if the polymorphonuclear cells are in their normal proportions—not over 60 per cent of the total. If there are, say, 16,000 leucocytes per c.mm. and the polymorphonuclear cells are, say, 72 per cent of them all, it is probable that there is an infection ; and although this infection may not be in the form of local pus the figures will be suggestive and pus somewhere will be searched for with redoubled care. The history and any local tenderness on gentle examination will guide one. Clinical acumen is very important in this connection, and it succeeds best when the examiner's mind is as free as possible from preconceived ideas. Very thorough gentle examination is essential. Laboratory tests help not at all beyond telling one that there is probably pus somewhere. The most difficult cases concern :—

Pelvic conditions  
Periproctal conditions  
Hepatic and gall-bladder infections  
Atypical empyema thoracis

Actinomycosis  
Perinephric abscess  
Dental abscess (sometimes)  
Nasal sinus suppuration.

There is almost sure to be something in the history to guide one to the department to which to pay most attention : Pain in the lower part of the back or menstrual disorder for pelvic conditions ; relation of pain to defecation ; cough or dyspnœa ; headache ; and so on. Yet one has diagnosed typhoid fever in spite of the patient's saying from the start that a tooth hurt him, and had the mortification of finding that the typhoid temperature disappeared when a gum-boil burst later on. One must pay the closest attention to every word that the patient says as to pain or tenderness, even if the listening means apparent waste of time over all sorts of unessentials. Skiagraphy may help one much in regard to dental abscess, buried empyema, hepatic abscess, chronic bone abscess, and nasal sinus infection ; but negative X-ray findings cannot be relied on always. Hepatic abscess is unlikely in England, unless after local injury, except in those who have resided in the Tropics ; but the state of the

diaphragm seen under the X-ray screen may point to the site of the trouble. Gynæcological abscesses need special tactile diagnosis. Nasal sinus infections call for diagnosis by specialist examination, yet apparent negativity does not exclude local infection, notably as regards the frontal sinuses. One has to rely greatly on virile clinical opinion, most of which comes from gumption plus experience.

*Actinomyces* presents one of the biggest difficulties of all; although the condition is not so rare that it can be neglected, it is not so common that many of us see a number of cases. As a rule the diagnosis is missed until the possibility of cure by vaccine and iodide of potassium has become remote, the nature of the case becoming obvious only when the dull red soddening of the overlying tissues is followed by the discharge through several different shallow openings of the thin serous pus containing granules, sulphur-coloured or dark grey, staining typically by Gram's method; or until the patient dies and the typical reticulated abscess is found post mortem. The occupation of the patient as a groom, a straw-worker, a farm-hand, or a cotton-worker might suggest the diagnosis earlier; but there is no serum reaction or blood test that assists.

**Tuberculous Conditions.**—As a cause of continued pyrexia these conditions are of the greatest possible importance, because it is by recognizing early that the causal germ is the tubercle bacillus that cure by guiding nature is possible. One has referred already to the danger of diagnosing as 'influenza' pyrexial bouts that are really due to tubercle. When tubercle is a possibility, no stone should be left unturned to clinch the diagnosis as early as possible one way or the other. And yet to become tubercle-mad is just as dangerous; to diagnose the existence of a tuberculous lesion when none exists is almost as detrimental to the patient's future as is the omission to recognize it when the patient is curable. The thing is to aim at being accurate either way; if tubercle is present, it should be diagnosed; if no tubercle is present, it should be excluded; but it should be diagnosed or excluded upon definite evidence and not by guess-work. A patient once diagnosed as tuberculous is labelled and taboo for years; a tuberculous patient missed has his very life at stake. Yet accuracy in the early diagnosis of tubercle is far from easy. There are two types—the pulmonary, and the 'surgical', the latter being glandular and the rest other than pulmonary.

*Pulmonary tuberculosis* is easy to diagnose if there are tubercle bacilli in the sputum; but in the early stages, though pyrexia may be pronounced in the 'pousses évolutives', the lesions are not 'open' and the sputum tests are negative. They may be negative for months, and reliance on their negativity may lead to disaster. X-ray examination associated with skilled interpretation of the skiagrams—skill in this is very essential because the difficulties in early cases are great—may be very important indeed, especially as regards sub-apical mottlings. I am no believer in 'root' phthisis, and there is as much unsoundness in what is written and believed about 'root' phthisis as there is about intestinal intoxication; but sub-apical mottlings, interpreted by a non-biased expert, may lead to a diagnosis nearly as sure as is the diagnosis of a non-expert who learns that tubercle bacilli are present in his patient's sputum. Physical signs are most misleading, even in the hands of experts; but if, on palpation, one feels a hollowing of the supraspinatus on one side as compared with the other, expert X-ray examination should be sought at once; the earliest physical signs of phthisis are evidenced on inspection and palpation, in my opinion, long before percussion or the stethoscope is of any use at all. Reliance on physical signs, however, is precarious, even if one may obtain guidance from them; X-ray findings, properly interpreted, are surer, though only sputum tests are clinching.

Some lay stress on the value of a curve obtained by plotting out the numerical proportions of polymorphonuclear cells in the blood whose nuclei contain 1 lobe, 2 lobes, 3 lobes, 4 lobes, 5 lobes . . . respectively. There are points of value in the curve obtained, but it cannot be relied upon in diagnosis. As regards prognosis, however, in a patient known to be tuberculous, the higher the proportion of few-lobed nuclei in the polymorphonuclear cells, the less good is the patient's condition at that time.

*Glandular tuberculosis* may exist without being suspected. It has nothing to do with pulmonary tuberculosis; glandular tuberculosis is milk-borne, pulmonary may or may not be. Hardly any cases of pulmonary tuberculosis show gross glandular infection as well; even the bronchial lymphatic glands are seldom caseous when seen in the post-mortem room. Glandular tuberculosis is commoner in children and the young than it is in adults, and many instances of continued pyrexia in children are the result of deep-seated glands infected by tubercle bacilli. The diagnosis is difficult enough to be one of surmise rather than true diagnosis in many instances, unless, of course, there are obvious tuberculous glands in the neck. How often does one find unsuspected caseous glands in the abdomen of a child killed accidentally by a motor-car or otherwise? Again and again; yet there has been nothing during life to tell of the infection. Some of these patients exhibit bouts of pyrexia from time to time, or slight pyrexia extending over a long time. How is one to decide that the cause of the pyrexia is internal glandular tubercle? There is no certain way, but there are the bouts of otherwise unexplained pyrexia; the periods of 'looking peaky'; the fact that the patient has been drinking milk not known to be non-tuberculous—I would venture the belief that almost all glandular tuberculosis is due to bovine tubercle imbibed in milk; the suggestive little shotty pellets that may often be felt in the neck on either side of the sternomastoids, lower down than would be glands inflamed from tonsils, adenoids, or teeth; and over and above these are the opacities that may be seen in a skiagram of the chest taken obliquely so as to show the state of the bronchial, peribronchial, and mediastinal glands. None of these points alone would prove tuberculosis of internal glands, but if all are positive the accumulated evidence makes it difficult to exclude tuberculosis of bronchial, mediastinal, or abdominal glands as the cause of the irregular continued pyrexia, no other cause being discoverable. If the condition is allowed to drift, the patient does not necessarily die; but on the other hand he may pass on to general tuberculosis and meningitis—a condition that nearly always has caseous glands as its precursor; or abdominal pains may ensue, and presently abdominal lumps, a reddened infected umbilicus, or frank ascites, when it will be obvious that he has tuberculous peritonitis—a state of affairs which is not primary but is a result of tuberculous intra-abdominal glands which have been present unsuspected perhaps for months previously.

**Infective States due to Local Infections other than Tuberculous, without Actual Collection of Pus in any Definite Focus.—**

Tonsillitis  
Tonsils and adenoids  
Mastoiditis  
Dental infections  
Coli-bacilluria  
Cystitis  
Phlebitis  
Cholecystitis  
Pylephlebitis  
Cholangitis  
Rheumatoid arthritis  
Fibrositis  
Colitis

Pancreatitis  
Vesiculitis  
Orchitis  
Epididymitis  
Infective nephritis  
Bronchiectasis  
Sinusitis  
Pleurisy  
Infective endocarditis  
Secondary syphilis  
Parasitic conditions  
States of minor septicæmia.

The main things here, as always, are to obtain with deliberation a complete history from the patient, then to make a full examination of all parts before formulating one's provisional opinion, then, and then only, to ask for special investigations and tests after one has narrowed the possibilities down by clinical observation to such a degree that one knows with precision what further examinations and tests are wanted, and why.

There may be more than one source of infection. One might, for instance, find that a pyrexial patient has very infected teeth with apical 'abscesses' as shown by the X rays; urine culture may yield evidence of coli-bacilluria, which is common; and almost accidentally one may find definite local tenderness about the lower end of one femur—X-ray examinations of the latter may show a definite chronic abscess of the bone instead of the negative skiagraph one would have had if the tenderness had been fibrositic from the dental disease. It has been partly through paying too much attention to discovered dental infections to the exclusion of other possibilities that treatment by wholesale dental extractions has so often failed. One has seen patients with symptoms severe enough to suggest typhoid fever, yet cured by the extraction of a single tooth; but one has also seen patients with X-ray evidence of infection of almost every remaining tooth unrelieved of any of their symptoms by dental extractions, because the real cause of their pyrexia lay elsewhere—gall-bladder infection, pulmonary tuberculosis, coli-bacilluria, gonorrhoeal pyosalpinx, infective colitis, or something else.

Urine cultures may be as misleading as they may be helpful. It does not follow by any means that a micro-organism recovered upon urine culture is infecting the kidney itself. The urine may contain germs excreted from the blood and brought by the latter from a distant focus without the kidneys or bladder themselves being actually infected. Streptococci-uria is common, yet streptococcal infection of the kidneys is not. The interpretation of the urine cultures needs clinical as well as bacteriological nous. It does not even follow that when *B. coli communis* is recovered in abundance and in pure culture from the urine by a bacteriologist, the kidneys or bladder are themselves actually infected; it may be merely being excreted, and treatment should be directed to the focus from which it is derived and not to the kidney or bladder infection that might be surmised to exist; yet coli-bacilluria with kidney damage is a common malady, causal of prolonged pyrexia, and amenable to special treatment for itself. It may occur without symptoms pointing directly to kidney or bladder, especially in children; yet may make the patient very ill, with pyrexia, even rigors, and a state of affairs that may be alarming. When the kidneys themselves are infected, the urine is almost certain to show polymorphonuclear leucocytes and renal cells in numbers in addition to the germs. Cytological examination is important in addition to bacteriological, yet even with this help one may be misled—for example, the *B. coli* may be infecting the gall-bladder as well as the kidney, and the source of the pyrexia may be the cholecystitis and not the coli-bacilluria; in which case successful treatment may necessitate cholecystotomy or cholecystectomy rather than urotropine, citrate of potash, and coli vaccines. Here, as always, clinical acumen in deciding what department to treat and how to treat it is of the utmost importance; and none of us is always right.

*Phlebitis* is a commoner cause of prolonged pyrexia than might be thought. All of us know the pyrexial course of an ordinary case of phlebitis in the leg; but how many of us think of phlebitis elsewhere, when there is no local œdema to call attention to it? How many of us have seen the catastrophe of a sudden death from pulmonary embolism about ten days after a successful abdominal operation in a patient who seemed to be doing perfectly well? Such pulmonary

embolus is the result of a massive embolism from a clot in a big vein such as an iliac. The clot was unsuspected, yet it was there. In how many cases do similar clots occur but remain undislodged? In how many is such unsuspected internal clotting responsible for pyrexia lasting perhaps for weeks after the operation, the precise cause of the pyrexia remaining bafflingly obscure? Is all post-operative pneumonia due to the anæsthetic? I doubt it very much; in my opinion many post-operative lung troubles are the result of small non-fatal emboli from venous thrombi near the site of the operation.

*Rheumatoid arthritis* develops in stages; in the end, is distinguished merely by deformed joints or analogous mischief, the deformities themselves being but the result of damage done by microbes or by microbial toxins. Whereas in the later stage there may be no pyrexia at all, in the earlier phases, when the mischief is in process of being produced, there is decided, even if low, pyrexia, often lasting for weeks, and generally recurring in periods with quiescent apyrexial intervals. When there are pains and local joint-swellings the diagnosis is easy enough, and one seeks the cause in focal microbial infection, often in connection with teeth, but sometimes elsewhere—for instance, gonorrhœa, or coli-bacilluria, or bronchiectasis, or diseased tonsils, an infected gall-bladder, or chronic appendix, the latter a very dubious diagnosis as a rule, though it is sometimes made to satisfy the patient and even the doctor also. The main thing to remember in these cases is that the sciatic or other pain that the patient complains of, or the lesions seen around infected joints, are not the disease itself, but are merely the result of a disease-process derived from elsewhere in the individual patient. Precisely the same type of pyrexial bouts may occur, and from precisely the same causes, without there being any arthritis, peri-arthritis, or fibrositis at all. The arthritis or fibrositis is accidental to the illness; the cause is microbial, and there are many cases of 'fibrositic' pyrexia without any fibrositis at all. These cases require the same methods of diagnosis as if actual fibrositis or peri-arthritis were a part of their clinical picture. The pyrexia is the same; the illness is the same; and yet to many the label would be different. It ought not to be so if one bases one's diagnosis on cause.

*Colitis* is a term that is much misused; it seems to be applied nowadays to almost any condition of bowel-obstinacy, and equally to conditions of diarrhœa. It is a term so ill-defined that it would be better not used at all. Infective states of the bowel are probably far rarer than is the diagnosis of them, and I am not at all convinced that colitis as the term is used is a cause of many cases of prolonged pyrexia.

*Vesiculitis, orchitis, and epididymitis* will generally be obvious on local examination; the liability is to miss them through omitting to seek for them for one reason or another. Similarly, perhaps, in regard to *proctitis, periproctitis, prostatic infection, and thrombosed piles*, though the patient's complaint about rectal pains, or pains related to the rectum, is less likely to be suppressed than may be a complaint about the genital organs.

*Infective nephritis* differs from coli-bacilluria in that it is generally a complication by ascent from the bladder or lower down. It is associated with pus in the urine, and even when primarily tuberculous there are generally local symptoms which lead to accuracy in diagnosis by local investigation, including perhaps cystoscopy and ureteral catheterization, with or without skialography. It may cause severe and prolonged pyrexia, usually associated with rigors at long or short intervals. The diagnosis resolves itself into deciding precisely what is the matter in the urinary department—a state of affairs quite different from that of ordinary coli-bacilluria, with which there may be hardly any urinary symptoms, especially in the young.

*Bronchiectasis* as a cause of prolonged pyrexia is usually indicated by the story and by the physical signs in the chest. The chief difficulty is, as a rule, to decide whether the condition is primarily bronchiectasis, or alternatively an empyema, small and tucked away, periodically discharging its contents through a bronchus when the pus collects sufficiently. In the end such an empyema leads to surrounding bronchiectasis; but if it is diagnosed and located early enough, the buried empyema is curable by surgery in a way that bronchiectasis by itself is not. This is the importance of the differentiation. If from time to time, with cough more or less all the time, the patient suddenly coughs up quite a quantity of foul pus out of proportion to his expectoration of the previous days or weeks, a buried empyema is the more probable diagnosis; especially if the pyrexia disappears, or lessens considerably, for the time being after the coughing up of such increased amount of pus. The distinction may seem immaterial, but it is important because the buried empyema can be cured by surgical drainage, whilst the cure of bronchiectasis alone by surgery is much less certain.

*Sinusitis* as a cause of continued pyrexia is fairly common, and everyone is familiar with the signs; yet strange to say one meets repeatedly with patients who may have ailed for weeks or months, and yet no one seems to have paid any attention to the complaint of local tenderness over the forehead, over one or other frontal sinus, over the root of the nose, or over one or other cheek bone, as indicative of possible infection in frontal, ethmoidal, sphenoidal, or antral air cells. Yet any one of these may cause illness with more or less continued pyrexia. X-ray examination, if positive, may help much, but X rays may show no opacity at all in a sinus that is infected. Nasal experts with their special methods of examination may pass as normal sinuses which are the cause of pyrexial illness; it has been known for them to pass as normal a frontal sinus from which the patient has developed fatal suppurative meningitis within a week. Specialist knowledge in this department can be most helpful, but it is not infallible either in diagnosing disease or in excluding it. Local tenderness puts one on to the possible diagnosis; and such local tenderness—over a frontal sinus or over an antrum of Highmore—should always be treated with respect in any case of continued pyrexia if no other cause for the pyrexia can be found.

Local tenderness over the *mastoid* air-cells seems to be of far less importance. Mastoid infection, if it leads to pyrexia at all, seems to cause a subacute or acute condition rather than the semichronic state of affairs that is met with from frontal, ethmoidal, sphenoidal, and antral infections, which may last for months sometimes without being recognized.

**Infective Endocarditis.**—Infective endocarditis is a recurrent difficulty. Fortunately it is not extremely common. The trouble is that when a case first comes under notice one is more than likely to underestimate the importance of the pyrexia. The patient may scarcely complain of feeling ill, and one is liable to take a lenient view and later become chagrined at the result. Few cases of infective endocarditis conform to the old conception of the two types—typhoidal and septicæmic. Most are other; they are of the insidious or long-drawn-out type. Many last for months; some for over a year. One needs to be wary at the start. If one knows that the patient has a chronic valvular lesion, and finds that he begins to get bouts of pyrexia, no matter how mild, one should be guarded in the opinion one gives. No case of ordinary organic heart disease ever has pyrexia lasting a fortnight without either showing definite evidence of a cause of pyrexia such as tonsillitis, pleurisy, typhoid fever, or something of that sort, or else raising an increasing suspicion of infective endocarditis—the suspicion being based on the pyrexia alone if there is no other



obvious cause for it. A patient with a cardiac bruit developing pyrexia of over three weeks' duration without something presenting itself to account for the pyrexia has almost certainly got infective endocarditis even if he says he still feels fit enough to go to business. This being so, the vital point is to feel for the spleen. If the latter is palpable and the clinical picture excludes typhoid fever, the diagnosis is virtually certain. No case of valvular heart disease exhibits a palpable spleen from back-pressure alone; a palpable spleen in a case of organic heart disease with continued and otherwise inexplicable pyrexia means infective endocarditis, and death from this within some months, even though the patient may say that he still feels perfectly fit. The spleen, the temperature, and the heart lesion give the diagnosis quite apart from what the patient feels, and quite apart from blood-counts or any laboratory investigation that can be named. One has seen this time and again. A palpable spleen in an organic heart case almost always means infective endocarditis, even if there is no pyrexia. Many cases of infective endocarditis have apyrexial intervals. The illness goes on and on, worsening progressively, and if there is any period of pyrexia that state of affairs must always be considered grave. Many organic heart-lesion cases have mouth-temperatures that are subnormal, well below 98.4° F., so that a temperature of even 99° F. is serious in some of them; if it is associated with an enlarged spleen, a temperature of even 98.8° F., if it is recurrent, is suggestive of infective endocarditis of the insidious, long-drawn-out, but none the less fatal, sort. There is generally no leucocytosis; polymorphonuclear cells may or may not be relatively increased; blood cultures may be quite negative until the malady is in a late and obvious phase. Always respect continued pyrexia in a heart case if no decided alternative cause for the pyrexia can be found.

Great difficulty presents itself when there is no bruit; a murmur will develop sooner or later, but this may not be for weeks if the heart valves were previously healthy. Typhoid fever may be suspected, but the Widal reaction will remain negative, and the lymphocytes will not be relatively increased in blood-films. Any evidence of embolism is almost pathognomonic, apart from cerebral embolism, which may occur in cases of mitral stenosis that have no super-added infective endocarditis. Linear blood-streaks in the nails, Osler's tender spots on the backs of the fingers, hands, or feet, sudden hæmaturia, purpura—these are amongst the various embolic phenomena that may tell one that the patient, who may say he is in robust health, has fatal infective endocarditis. Feeling the spleen and finding the temperature raised over a period may clinch the diagnosis.

**Tropical Conditions** causing continued fever are various. The chief conditions to bear in mind are chronic malaria and hepatic abscess. Others will be suggested by the special geographical circumstances of each case.

*Malaria* is suggested by the character of the rigors, and by the patient himself—he has had it before. The blood will show no leucocytosis; a relative increase in the large hyaline corpuscles; and, if no quinine has been taken, one or other of the various malarial hæmatozoa. Quinine has generally been taken already, so that hæmatozoa may not be found; then the leucopenia and the relative increase in the large hyaline corpuscles are suggestive, though strict accuracy of diagnosis may remain in doubt.

If *hepatic abscess* is the alternative, there will almost certainly be leucocytosis, and no increase of the large hyaline corpuscles unless the patient has malaria as well; it is the polymorphonuclear cells that will be relatively increased if the malady is hepatic abscess only. Local tenderness may be present over the liver; the X rays may show undue opacity of some part of the liver, or deformity of the diaphragm above the abscess. Sometimes, however, the

differential diagnosis in this country may remain obscure, and one may resort to therapeutic tests. If the pyrexia yields to quinine treatment, one may conclude that the diagnosis was malarial; whereas, if quinine fails and cure results from emetine injections, one will have support for the view that the cause of the pyrexia was amoebic hepatitis or abscess.

**Syphilis** in secondary or later stages has become rare owing to successful early treatment. Formerly the secondary stage was often associated with continued pyrexia. The characteristic sore throat, and the multiform raw-ham-coloured skin rash makes the diagnosis easy to those who have seen the condition.

**Head Injuries** may be followed by pyrexia without any other cause than the head injury itself. The history suggests the diagnosis. The main thing is not to miss suppurative of an associated internal hæmatoma—intrathoracic, perirenal, or other—as the cause. Perhaps head injuries are sometimes followed by chart-pyrexia owing to traumatic interference with the nervous heat-regulating mechanism either in the corpus striatum or in the cervical region of the spinal cord.

**Parasitic Conditions.**—There are various parasitic infections, tropical and otherwise, that may cause the patient's temperature chart to be a variable line above the normal, but there is nothing characteristic about any such charts. Ordinary tapeworms in adults cause no pyrexia as a rule, nor do hydatids unless they suppurate. It remains to mention *Oxyuris vermicularis* and *Ascaris lumbricoides* and their possibilities. These two worms infect the bowel after the swallowing of their ova; they produce few symptoms by themselves. It seems, however, that either or both may lead to the scattering of their ova throughout the human system, and that symptoms may arise therefrom, especially in children. The pronounced symptom in a child is troublesome and long-continued cough, especially from the carrying of *Oxyuris vermicularis* ova to the lungs in the blood-stream. Such cough may suggest irritation from tuberculous glands, or worse; or the after-effects of pertussis. Anxiety is thus created, though the whole thing subsides in time, generally undiagnosed because unsuspected. Whether there is pyrexia at the same time is a moot point, but it is a possibility; and perhaps some children who have both cough and pyrexia suggestive of some serious lung trouble may really be suffering from nothing worse than a temporary flood of *Oxyuris* ova to their lungs.

**Skin Diseases.**—Certain skin diseases are associated with continued pyrexia: pemphigus, hydroa gestationis, some cases of purpura 'simplex', and herpes iris are amongst these. It seems more probable that whatever causes the skin trouble is also the cause of the pyrexia than that the continued fever is due to the skin trouble itself. Nevertheless, the existence of the skin affection enables one to give a name to the nature of the pyrexia, particularly in pemphigus cases.

**Septicæmia.**—Septicæmia has been cited in the list above of causes of continued pyrexia; the label is a bad one, for in a sense it should include almost all that has been said in this article, from typhoid fever to pemphigus, excluding only functional pyrexia, malingering, and parasites. There is, however, little doubt that many patients present symptoms of illness with pyrexia of long duration, the cause of which is microbic, and yet without local causation that can be defined. The microbes just seem to get into the blood. Such things as leptothrix and tetragenus fever mentioned in *Group I* are but examples of special sorts of minor septicæmia. Minor organisms may cause septicæmia that is always minor; major organisms may cause septicæmia that is usually major and often fatal, but sometimes minor and either fatal over a longish period or else not fatal at all. It is all a question of degree. The symptoms,

if there is no local focus, will be simply those of pyrexia, anorexia, illness in general, and the degree of the general illness will vary with the dosage of the organism, its virulence, and the resistance of the patient. Labels for such cases may be as numerous as are the germs than can attack man. The diagnosis will depend on recognition of the causal germ—by blood culture or otherwise. A great many of such cases are bound to pass unrecognized, or at any rate only partially diagnosed, either to recovery or to death—except when skilled bacteriologists happen to detect the causal germ, either during life or post-mortem, by cultural methods. There is still much to be discovered in connection with such obscure cases, but there is nothing that one can tell the clinician to enable him to make the diagnosis by other than special bacteriological methods.

There remain for discussion three special types of cases of continued fever, namely: rat-bite fever; blood diseases; liver conditions.

**Rat-bite Fever** is unknown in a patient who has not been bitten by some animal, but amongst farmers, farm labourers, animal fanciers, and others of analogous occupation it probably occurs oftener than it is diagnosed. Many cases occur annually in Great Britain, but they are not all recognized. The malady is due to the introduction into the blood system of a spirochæte; the latter is transmitted by the bite of some infected animal, generally a rat, but possibly a ferret, cat, weasel, stoat, or the like. The bite itself may not be severe, and it may heal and be forgotten; from two to four weeks afterwards the patient develops pyrexia even to the height of hyperpyrexia, with headache, malaise, anorexia, after a rigor, pains all over, and takes to his bed with an illness that may readily be diagnosed as influenza. At the same time the site of the original bite may swell again and become red and painful, but without suppurating—a fact that by itself suggests the diagnosis. There may be generalized urticaria or other widespread skin eruption, possibly suggesting measles or scarlet fever. After a day or perhaps two in bed the patient feels and looks well again, the local bite has settled down completely, and the transient severe pyrexia has gone. All seems well for a time, perhaps four or five days, or even a week, when a recurrence of precisely the same symptoms takes place. This state of affairs continues, with pyrexial bouts and recrudescence of local swelling of the original bite every four or five days or so for an indefinite period—even for several months—unless an injection of **Salvarsan** or one of its equivalents is given intravenously, when the whole thing ceases abruptly and the patient is cured. The diagnosis is given by the history of the bite, the periodic recurrence of severe pyrexial bouts at intervals of less than a week, the recrudescence of the local swelling at the bite-site on each recurrence of temperature, and by the cessation of the whole when salvarsan is injected. The malady is recognized easily when its main features are familiar; but it is often missed.

**Blood Diseases** are frequently associated with pyrexia which may continue for weeks and months without the patient's necessarily knowing from his own sensations that he is febrile. There may be none of the symptoms ordinarily associated with pyrexia. Appetite may remain fair, and the patient may have no desire to remain in bed even when the anæmia itself may seem to an onlooker to be severe. This is true of pernicious anæmia, splenomedullary and lymphatic leukæmia, and lymphadenoma (Hodgkin's disease).

So true is it of *pernicious anæmia* that one would feel chary, in a case of definite and untreated severe anæmia, of diagnosing it as pernicious anæmia unless the line of the temperature chart were persistently above the normal. This point may sometimes serve to differentiate secondary anæmia due to blood loss, or anæmia in a case in which the type of the blood-count may leave one

dubious. It is rare to see a case of pernicious anaemia, otherwise than in a remission, or when improved by treatment, without the temperature being slightly or even definitely above normal at any hour of the day or night; though the pyrexia diminishes and disappears when improvement sets in under treatment by liver extract, arsenic, and rest in bed.

The *leukemias*, lymphatic and splenomedullary, are associated with symptomless pyrexia less constantly than is pernicious anaemia. There may be no pyrexia at all. Yet, without any side-evidence as to whether the patient is improving or worsening, there may be a pyrexial period lasting a week or two, or several weeks, before the temperature again becomes normal for a while. The pyrexia recurs, or does not recur, without apparent rhyme or reason, and without any indication from the patient's symptoms as to whether there is pyrexia or not.

Cases of *lymphadenoma* (Hodgkin's disease) may exhibit pyrexia, or may not. When they do exhibit pyrexia the latter may be irregular and continued, or intermittent, without being characteristic; but every now and then one meets with a case that exhibits a definitely characteristic chart of the type that has become known as Pel-Ebstein's disease. In these cases there is periodicity of the pyrexial periods reminiscent of relapsing fever, though the patient does not necessarily feel more ill when he is pyrexial than he does when his temperature is normal. Frederick Taylor recorded a chart in such a case continuously for over a year; it is typical of them all. The apyrexial periods last a week, ten days, or a fortnight; then there is a week of crescendo-diminuendo pyrexia; and then the whole thing repeats itself and may continue to do so regularly for many months. The type is easy of recognition when a prolonged chart is before one; less easy when one sees the patient in a period of pyrexia for the first time. When the enlarged glands are axillary or in the neck or groin the cause of the pyrexia may suggest itself, but when they are abdominal or mediastinal it may be some time before one thinks of looking for them with the X rays. Blood-counts are negative. The spleen may be enlarged, and even typhoid fever may be suspected on the first occasion of finding the pyrexia; but the course of the illness gives the diagnosis ultimately.

**Liver Conditions apart from Gall-bladder Infection.**—One needs, finally, to remember that any gross affection of the liver—quite apart from gall-stones, cholangitis, pylephlebitis, cholecystitis, or empyema of the gall-bladder—is liable to be associated with pyrexia, the degree of fever seeming to bear little if any relationship to the degree of the patient's feeling of illness at the time. One sees instances of this in cases of alcoholic cirrhosis of the liver—a daily rise and fall that has been called 'mole-hill' pyrexia, lasting week after week and beginning sometimes long before the onset of ascites. There may be analogous pyrexia when the liver is the site of secondary new growth, more often carcinoma than sarcoma. There is no need to assume that there is additional microbial infection of the liver in these cases, and the patients appear to be no more ill when pyrexial than they would be were their cancerous liver trouble apyrexial.

## PYURIA IN CHILDREN.

*Reginald Miller, M.D., F.R.C.P.*

For some years the discordant conclusions of authors on some of the details connected with this subject, as on, for instance, the sex incidence of so-called pyelitis, have pointed to the desirability of greater accuracy in defining exactly what is meant by the term, 'pyuria', when used clinically.

**DEFINITION.**—C. Dukes,<sup>1</sup> in 1928, elaborated a method of counting the number of pus cells in specimens of urine, and J. Cumings<sup>2</sup> gives results of the use of this method in a series of observations. He is satisfied that it is of

value, not only in differentiating the abnormal from the normal, but also in estimating changes from day to day in the progress of cases undergoing treatment. The specimens of urine are not collected by catheter, but in the case of a female child with a vaginal discharge thorough washing must first be carried out round the vulva and urethral orifice with such a lotion as boric acid or normal saline, and only a second portion of the urine passed is examined. A drop from the specimen well mixed is placed by a pipette on an ordinary counting chamber, the pus cells being counted in the usual way, and the result given as a total number per cubic centimetre. Cumings gives the results of his experience as follows. First, leucocytes may occur in the urine of normal children: in boys up to 10 per c.c., and in girls up to 100 per c.c. may be considered within the normal; more than these indicates a pathological condition. Secondly, obvious opalescence of the urine does not occur until the pus cells in the urine reach at least 200 per c.c., and therefore a microscopical examination of the urine is necessary before pyuria can be excluded. Lastly, bacilluria does not occur in normal children. In his paper the author quotes some good examples of the value of these counts in estimating the improvement in the infective process.

**ETIOLOGY.**—The route by which the urinary tract of children becomes infected is still a matter of debate, but there is no necessity to believe that the same route is followed in all cases. D. Nabarro<sup>3</sup> gives a good description of the state of the argument between those who support different views. Three possible routes have to be considered: via the urethra (direct ascending infection); via the blood-stream; and via the lymphatics. R. W. Robinson<sup>4</sup> discusses the same problem. It is hardly necessary to go through the rather well-worn arguments on this point now; but it may be emphasized that, if the above work of Dukes and Cumings is accepted, the material on which present arguments are based may require a good deal of sifting before it is regarded as reliable.

The most common micro-organism to infect the urinary tract is, as is well known, the *B. coli*, and Nabarro<sup>3</sup> finds that its most frequent associates are *B. proteus* and streptococci, and that rarely either of these may be the sole infecting agent. A considerable number of other micro-organisms may also occur in urine, and Nabarro suggests that, so great is their variety, they are probably secondary invaders. He also lays stress on the importance in long-lasting cases of re-examining the urine from time to time to see if any alteration in the infecting agents has occurred. Mary A. Griffin,<sup>5</sup> in 60 cases of pyuria in children, found various members of the *B. coli* group alone in 38 cases, streptococci alone in 7 cases, and streptococci and coliforms together in 15 cases. These were the only micro-organisms found in the series. She was also able to demonstrate the presence of agglutinins to the infecting micro-organisms in the blood during the acute phases of the infection in some cases, but found that they rapidly disappeared as the infection subsided.

**Pyelitis.**—B. Chown's<sup>6</sup> memorable paper in 1927 questioned our whole conception of the disease which we term 'acute pyelitis'. He brought evidence to show that this was a misnomer, and that what we regard as acute pyelitis is in reality a diffuse interstitial nephritis. To the present reviewer Chown's work was impressive and was made all the more acceptable by the difficulty of imagining an infection limited to the pelvis of the kidneys. It is, of course, well recognized that fatal cases show severe involvement of the substance of the kidneys, and some degree of such involvement is clinically obvious in some severe cases which ultimately recover—œdema, twitchings, convulsions, and the presence of casts in the urine. A. V. Neale,<sup>7</sup> pursuing this line of thought further, has examined the blood-urea in cases of acute pyelitis, and finds that it

tends to be raised soon after the onset of the disease. He concludes that this nitrogen retention indicates some temporary renal impairment, and finds that the absence of casts from the urine does not preclude this possibility. In cases which make a complete recovery all evidence of renal impairment rapidly disappears. One interesting observation of Neale's deserves special mention as it must necessarily be of extreme rarity. One case of acute pyelitis, two weeks after complete recovery, died of other causes, and a careful examination of the kidneys, ureters, and bladder revealed no signs of anything abnormal.

**Chronic Pyuria.**—The investigation of cases of chronic pyuria in children with a view to making an exact diagnosis of the cause of the condition has often been a matter of difficulty. One reason for this is that, although cystoscopy can be satisfactorily carried out in them, ureteric catheterization may be very difficult, and in some cases impossible. The introduction of **Uroselectan** has therefore been of peculiar value in the diagnosis of these chronic cases in children. Uroselectan, a pyridine compound containing 40 per cent of organically combined iodine, is opaque to X rays and is practically non-toxic. It is rapidly excreted by the kidneys if advanced renal disease is not present, and appears in the bladder in about ten minutes after intravenous injection. Soon after this the renal pelvis, ureters, and bladder become distinctly outlined in radiograms. The use of this method has demonstrated that a chronic pyuria is almost invariably to be accounted for by the presence of some local abnormal state in the kidney or urinary tract. More particularly it has emphasized the importance of congenital anatomical abnormalities as underlying causes of chronic pyuria in children. Bugbee (quoted by R. W. Robinson<sup>4</sup>) found in 4090 children 117 abnormalities which were thought to be sufficient to influence any infection which might arise. W. Sheldon (in figures given by Nabarro<sup>5</sup>), in 400 consecutive autopsies on children, found 10 with congenital abnormalities of the urinary tract. Neale, in the paper under review, fully bears out the extreme importance of these congenital conditions in explaining the persistence of pyuria in chronic cases.

**TREATMENT.**—There is nothing new to report in connection with the treatment of the acute type of case. Most authors are satisfied with the results obtained by the use of **Alkalis**, followed, if complete cure is not established, by a course of urinary antiseptics such as urotropin. In chronic pyuria, not due to calculus but associated with some congenital anatomical abnormality, Neale states that the only treatment is surgical, and this, of course, is only possible in unilateral cases. Palliative treatment in his hands has proved of little benefit: he instances renal lavage with colloidal silver, antiseptic irrigation of the bladder, and the administration of alkalis, hexamine, hexyl-resorcinol, pyridium vaccines, and bacteriophage as all of little worth in this class of case. On the other hand, where surgery has been able to extirpate the diseased area he has found a complete and lasting cure, with normal urinary excretion after ensuing years. In bilateral cases palliative treatment is all that can be attempted as a means to ward off the inevitable death from uremia.

**REFERENCES.**—<sup>1</sup>*Brit. Med. Jour.* 1928, i, 391; <sup>2</sup>*Ibid.* 1931, i, 305; <sup>3</sup>*Ibid.* 1930, ii, 414; <sup>4</sup>*New Eng. Jour. Med.* 1930, Dec. 4, 1139; <sup>5</sup>*Glasgow Med. Jour.* 1930, July, 21; <sup>6</sup>*Arch. of Dis. Childh.* 1927, ii, 97; <sup>7</sup>*Ibid.* 1931, vi, 165.

**QUINSY.** (See TONSILS, DISEASES OF.)

## RADIUM TREATMENT OF CANCER.

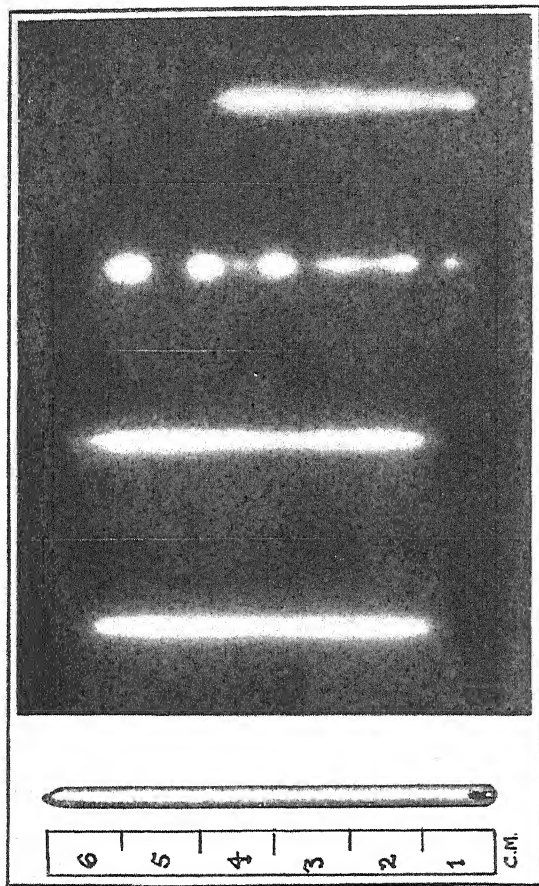
Stanford Cade, F.R.C.S.

A careful analysis of the bulk of published contributions in connection with radium therapy since the preparation of the last volume of the **MEDICAL ANNUAL** shows most encouraging progress both in the clinical and in the purely scientific fields. The wave of enthusiasm followed by the natural recoil is

# PLATE L

## DISTRIBUTION OF RADIATION IN RADIUM NEEDLES

(S. RUSS AND D. P. CEFMAN)



Auto-photography of radon (A) and radium (B, C, D) needles, showing correct and incorrect distribution within the needles.

*Fig. kind permission of the 'Lancet'*

## PLATE LI

RADIUM THERAPY: SCREENAGE OF BETA-RADIATIONS



Drawing illustrating the effect of additional copper screenage which eliminates a portion of the secondary beta-radiation. Both the right and the left groups received an identical dose—683 mg.-hrs. The only difference in treatment was the extra screenage on the left side. The right side peeled extensively, whereas the screened side pigmented.

MEDICAL ANNUAL, 1932



gradually being superseded by careful study in numerous centres. A review of the most notable advances can be usefully subdivided into: (1) Scientific contributions; and (2) Clinical application of radium therapy in malignant disease.

### 1. SCIENTIFIC CONTRIBUTIONS.

These are numerous and of a twofold interest—purely scientific, and in application to practical medicine.

**Distribution of Radiation from Clinical Radium Tubes.**—Professor Sidney Russ<sup>1</sup> has drawn attention to the unequal distribution of radium within the needles in clinical use. By a series of photographic tests on radium tubes and needles faulty distribution within needles was discovered (*Plate I*). As all those who employ radium may wish to reassure themselves about their own radium tubes, a brief description of the photographic tests may be of service. For the individual tubes quarter-plate special rapid duplitzed X-ray films were used. The radium containers were placed between parallel lines plotted out upon the wrapper, and the number of each tube was written above it. Before development, both numbers and position mark were copied on to the side of the film. With the tubes laid upon the film exposures were made for two minutes. The shadows obtained gave an accurate picture of the distribution of the radium within the needles. The importance of the test is such that purchasers of radium may find it necessary in the future to insist upon guarantees relating to the distribution of the radium in tubes, as well as certificates of purity and quantity. The method of auto-photography is equally useful in testing the uniformity of radiation in collars and plaques used for surface irradiation. Auto-photographs show those parts of the field where the intensity of radiation is unequal, and by redistribution of the needles on the surface of the plaque, patterns can be obtained which give a uniform intensity throughout the surface area treated.

**Screenage of Secondary Beta Radiations.**—The injurious effects of secondary  $\beta$  radiations are well known; within the limits of clinical dosages the  $\beta$  rays are responsible for the majority of burns and for the peeling of the skin and delayed healing following the surface irradiation; in interstitial treatment secondary  $\beta$  rays may cause osteo- and chondronecrosis. Any attempt to diminish the effects of secondary  $\beta$  rays is worthy of close investigation. S. Benner,<sup>2</sup> of Stockholm, has pointed out the importance of taking this point into consideration when choosing the material for radium containers. In testing a number of different materials, he pointed out that substances with an atomic number between 26 and 50 gave off considerably weaker secondary  $\beta$  radiation than both lighter and heavier substances. By means of an ionization chamber using a magnetic field to deflect the  $\beta$  rays, the secondary  $\beta$  radiation from different substances was examined. The practical application of this experimental study is the introduction in the surface applicator of a secondary filter. In practice this consists in placing midway between the radium and the skin 1 mm. of nickel, stainless steel, brass, or copper. In the preparation of surface applicators, sorbo rubber, piano-felts, or Columbia paste are used. The radium skin distance varies in different centres. At Westminster Hospital it is 15 mm. By introducing in the centre of the plaque, 7 mm. from the skin, a layer of metal of medium atomic weight (0.5 to 1 mm. of copper) as much as 15 per cent of the secondary  $\beta$  rays are screened off. Clinically this can be demonstrated by treating two areas, e.g., both groins or both breasts, with an equal quantity of radium by an identical technique delivering an identical dose. If the treatment is continued till the desired clinical result is obtained, the cutaneous reaction on the two sides is strikingly different—

whereas on the non-protected side desquamation and peeling are obtained, on the protected side only the stage of pigmentation is reached (*Plate LI*). This advance in technique is of great practical importance; it enables the clinician to deliver without subsequent peeling a dose which, without the additional screenage, would lead to desquamation and require several weeks to heal. An increase in the total dose can also be obtained without necrosis.

The application of this principle in interstitial therapy presents certain difficulties. Benner suggested a platinum needle coated with 0.3 mm. of palladium; this reduces the secondary  $\beta$  radiation by almost 30 per cent. Such needles have now been constructed, and a preliminary experimental study has shown that Benner's hypothesis was correct.

**Split Doses of Gamma Radiation.**—F. G. Spear,<sup>3</sup> of the Strangeways Laboratory, Cambridge, studied the effect of split doses of  $\gamma$  radiation on tissue culture *in vitro*. He showed that with 10 mgrm. of radium, two irradiations of  $2\frac{1}{2}$  minutes give a different effect from a single exposure of 5 minutes. The effect varies also with the interval between the exposures. An interval of 80 minutes is more effective in bringing about a diminution in mitosis than an interval of 160 minutes. Spear also showed that a delayed lethal effect can be obtained by a much shorter total irradiation if the dose is appropriately divided, and that by this means the effect of a given irradiation may be greatly enhanced. Exposure to 300 mgrm. of radium for  $2\frac{1}{2}$  minutes at intervals of 80 minutes, until a total exposure of one hour has been given, produces a delayed lethal effect equivalent to that following a continuous irradiation of  $4\frac{1}{2}$  hours. Whereas Spear's studies showed the enhanced effect in tissue cultures, a similar conclusion was arrived at by A. Eidinow and J. C. Mottram<sup>4</sup> in the study of Jensen rat sarcoma submitted to divided irradiation. Their results strongly suggest that in the external application of radiation in the treatment of tumours, divided doses should be given a thorough trial. The practical application in clinical medicine has shown that a split dose leads to a more complete retrogression of the tumour, with less damage to the cutaneous tissues. This applies equally to rapidly growing tumours such as lymphosarcoma and to neoplasms of slow evolution such as an atrophic scirrhous carcinoma of the breast.

**Hypertrophic Response to Radium Irradiation.**—The question of stimulation of growth by radium has been occupying the minds of many investigators for the past twenty years. It presents a great clinical problem as to the possibilities of stimulating the growth of neoplasms by small doses of radiation. Numerous experiments by different workers (Lazarus-Barlow, Price-Jones, Mottram, Thouvenain) have given contradictory results. In a recent communication Daphne L. Goulston<sup>5</sup> describes a series of experiments to investigate the reaction of actively growing tissue to irradiation from radium needles and tubes which are identical with those used therapeutically. As material for her experiment was chosen the chorio-allantoic membrane of a chick embryo of ten-days incubation. A small window was cut in the shell, radium tubes containing 2 to 5 mgrm. of radium screened by 0.5 mm. of platinum were placed across the window. Eggs were irradiated in an incubator for two to five hours; the needle was then removed and the shell replaced in position and sealed with wax. Three days later the specimens were examined. This ingenious and well-conducted experiment shows that small doses of radiation from radium needles cause stimulation of growth in the chorio-allantoic membrane of the developing chick embryo. It would be premature and perhaps unwise to draw conclusions from this experiment as to the stimulating effect of small doses of radiation in the treatment of neoplasms. There are, however, a certain number of clinical cases which offer evidence that such

a possibility cannot be excluded. An early epithelioma of the buccal mucosa in an elderly patient was treated by a surface application of radium—the dose administered was 100 mgrm.-hours (50 mgrm.-plaque for 2 hours)—and was followed by rapid spread of the disease, both locally and in the lymphatic field; further treatment by interstitial methods proved that the growth was radiosensitive, as it disappeared after a few weeks. The glands, however, continued to grow in spite of irradiation.

**Effect of Radiation from Radium on Nerve Tissue.—**

*Effect on Nerves.*—The effect of radiation on nerves, spinal cord, and central nervous system is of interest in connection with the treatment of neoplasms of the brain and spinal cord and also in the study of the post-irradiation symptoms attributable to changes in the nerves in the vicinity of the area irradiated. Daphne L. Goulston<sup>6</sup> carried out a series of experiments designed to try and formulate answers to the following questions: (1) Will radiation from radium cause atrophy of the nerve-fibres? (2) What is the minimum time that must elapse before atrophic changes are observed? (3) What is the minimum dose necessary to produce atrophy? In a series of animal experiments the sciatic nerve was exposed and needles of various strength (10 mgrm. to 1 mgrm.) were placed in contact with the nerve. A careful histological study of the specimen showed that two effects follow the application of rays to nerves. These are a local atrophy at the site of radiation and a secondary Wallerian degeneration in the nerve-fibres below the atrophied region. The axis cylinders appear to be destroyed somewhat later than the splitting up of the myelin. These changes are noted twenty to thirty days after irradiation. The length of the atrophic segment varies with the active length of the needle. There is a minimal dosage below which no histological changes are induced; the minimal dose is 10 mgrm.-days. There were no signs of degeneration in any of the nerves even up to sixty-three days. The practical conclusion of these experiments is that the average clinical dose employed in the treatment of malignant disease is well below that shown experimentally to produce degeneration of nerves; this is in accordance with the known fact that normal nerve tissue is radio-resistant; treatment by interstitial, surface, and massive irradiation does not cause degeneration of nerve-fibres. With small doses of radiation degeneration of the myelin sheath only is observed.

*Effect on Spinal Cord.*—The effects of radon on the spinal cord were studied experimentally by Hugh Cairns and J. F. Fulton.<sup>7</sup> Cats and monkeys were employed; radon seeds of varying doses, but always 1.5 cm. long and screened by 0.3 mm. of platinum, were placed alongside the spinal cord in the lower dorsal region, outside the dura. The animals were carefully observed during the two or three weeks after operation, and several were studied for a period of four to five months. The first symptom noticed was loss of position sense; the animals invariably passed through a stage of extension before developing a characteristic complete flaccid paraplegia. The radon seeds were applied to the dorsal surface of the cord and the destruction proceeded in a ventral direction, the posterior columns being affected first, the ventral tracts last.

Degenerative changes occur in the normal spinal cord from the combined action of  $\beta$  and  $\gamma$  rays of radium employed in doses in excess of those used therapeutically. The effect of radiation on malignant growths affecting the spinal cord varies primarily with the nature of the growth, secondarily with its anatomical position in relation to the structure of the spinal cord. Secondary deposits affecting the vertebrae and producing pressure symptoms are susceptible to radiation. Those following carcinoma of the breast have been successfully treated by surface or distance application, the changes produced

being calcification and ossification of the tumour. Similar effects have been obtained in cases of sarcomata (lymphosarcoma) where the dumb-bell tumour extends from the mediastinum and causes pressure on the spinal cord. Functional recovery occurs in some cases, and, although the results are palliative, the relief obtained is remarkable.

*Effect on Cerebral Tissue.*—J. Paterson Ross and E. A. Carmichael<sup>8</sup> have carried out a series of experiments to ascertain the effect of radiation upon normal brain tissue. Rabbits were used for the experiments. Various quantities of radon and varying screenage were tried. They conclude that a large dose of radon can produce a local necrosis of cerebral tissue associated with hæmorrhage, that this change is limited to a radius of 5 mm. from the seed, and that destruction is followed by a process of repair. Increased filtration, as anticipated, diminishes the amount of destruction. Smaller doses (1.5 mgrm. filtered by 0.5 mm. of platinum), though destructive in nature, do not cause serious damage to the cerebral cortex.

Sir Percy Sargent and S. Cade<sup>9</sup> give an account of their experiences of implantation and surface application of radium in a series of cases of glioma of different type. They conclude that: (1) The effect of radium on normal brain tissue need not be feared providing the dose given is within therapeutic range and adequate screenage is provided; (2) Interstitial irradiation has a very limited field of usefulness; (3) Surface irradiation is at present the most useful form of ray treatment and is of wide application; (4) Preliminary decompression is essential; (5) Further study is to be directed to the relation between different types of tumour and their response to irradiation.

## 2. CLINICAL CONTRIBUTIONS.

The Medical Research Council gives an account of the results of radium treatment of cancer during 1930.<sup>10</sup> The Report summarizes the work of the thirteen centres under the Council. It points out that probability of success depends, as might be expected, on the site of the disease and the early or late manifestation of the growth. The most promising fields for radiotherapy are the buccal cavity, the cervix uteri, and the breast. Little progress has been made in the radiation treatment of rectal cancer, although cases are reported where advanced growths have been made operable as a result of radium treatment. In the case of œsophageal cancer the problem remains as far from solution as hitherto.

**Upper Air-passages.**—A complete account of the position of radiotherapy in cancer of the upper air-passages is given by Douglas Harmer<sup>11</sup> in the Semon Lecture for 1931.

*The Larynx.*—Intrinsic carcinoma of the larynx is one of the best types of cancer in the whole body, as it is possible to diagnose it while it is an entirely local disease. Given an intelligent selection of cases, the results are encouraging. Carcinoma of the ventricular band is highly radio-sensitive; of the vocal cord, favourable for rays; and in the subglottic area radio-resistant. Harmer considers that interstitial irradiation has given such good results that it is preferable to surgery. If the disease does not disappear at once, it will usually be arrested and there need be no hurry in deciding the further line of treatment. In cases where the growth is localized to the vocal cord, a simple fenestration operation is all that is necessary; when the growth has crossed the middle line, needles must be placed bilaterally. If the disease has extended into the subglottic area, a modified fenestration is required and a portion of the cricoid cartilage must be removed. Upward extension at times necessitates the removal of the corner of the hyoid. Pre- and post-operative external irradiation by X rays or radium is useful. (*See also* LARYNX, DISEASES OF.)

*The Hypopharynx.*—The treatment of cancer in this situation presents a complex surgical problem. It is relatively a common site of carcinoma, and a review of the results of all forms of treatment point clearly both to the imperfection of surgical methods and to the difficulty encountered in the radiation treatment. At a recent discussion at the Royal Society of Medicine the problem was carefully reviewed. Trotter advocates an operation which removes the tumour and its extensions freely, but retains both the larynx and a portion of the pharynx; he protests against laryngectomy in this group and maintains that cures are compatible with good functional results. Von Eicken (Berlin), dissatisfied with the purely surgical treatment, has sought a solution of the problem in radiological methods. The application of radium to the hypopharynx can be carried out by external or interstitial methods. Interstitial irradiation without opening the hypopharynx is the method of choice, as the risk of fistula is diminished and necrosis of the cartilage can be avoided by the removal of the laryngeal skeleton on the side of the disease. Trotter has pointed out that: "It is commonly supposed that the use of radium has greatly simplified the treatment of epithelioma of the pharynx. This supposition is not true. Radium has provided us with a new and very powerful addition to our means of attack, but so far from simplifying the attack, has made it more than ever dependent on experienced judgement and expert handling. It is possible even that up to the present time the total results as to cure, or notable periods of freedom from recurrence, are actually worse for the introduction of radium, since it seems likely that many patients who might have had a good chance of cure by operation in competent hands, have had their chance frittered away in ineffective radium treatment. If this is so, it is, of course, only a transient phase, for a proper appreciation of the technical requirements of sound radium treatment is already replacing the cruder view, and must in time result in the full benefits of radium being made manifest."

**The Nasal Sinuses.**—The method of choice in this situation is preliminary X rays followed by interstitial irradiation with radium. The transpalatal approach gives good drainage, offers a means of inspection, causes no external deformity, and defects of speech can be remedied by dental appliances. This method gives access to the maxillary antrum, the nasal fossae, and the ethmoidal and sphenoidal cells. The major portion of the growth is removed by diathermy, and the peripheral extensions are irradiated with small quantities of radium applied intermittently over prolonged periods (two to three weeks). Such treatment is not without danger, but has given good results in expert hands.

**Sarcoma.**—Very definite progress has been made in the radiotherapeutic methods in the treatment of mesoblastic neoplasms. The report of the Medical Research Council published in 1931 gives a list of 110 cases from seven centres. The term 'good result' means that the growth has disappeared and has not recurred locally. The following figures are of great practical interest:—

Spindle-cell sarcoma	gave 50.0 per cent of good results out of 24 cases						
Round-cell	"	41.0	"	"	"	"	22
Lymphosarcoma	"	23.5	"	"	"	"	17

The above data show that radium has a useful place in the treatment of sarcomatous growth.

In certain situations, such as the tonsil, sarcoma shows better results than carcinoma from irradiation. Harmer's collected figures show that of 92 patients with sarcoma of the tonsil, 59 are dead, 33 living, and 28 free from disease from three to five years or more. Of a total of 259 cases of sarcoma

of the upper air-passages, 110 are living (42 per cent). Harmer's own figures are 32 living from a total of 66 cases (50 per cent).

**Osteosarcoma.**—The treatment of sarcoma of bony origin by radiation presents certain new features which are of interest. The subdivision of cases into periosteal and endosteal growths gives an indication of prognosis. The effect of irradiation manifests itself clinically by a marked diminution in the size of the tumour and radiologically by a progressive calcification and ossification of the tumour, so that the mass of neoplasm is transformed into an osseous tumour, not unlike an osteoma. The method of treatment is distance or surface application through a multiplicity of ports of entry. A combination of X rays and radium has given in the reviewer's hands very gratifying results. The treatment is given in split doses, daily through small ports of entry; it is extended from three to four weeks. By careful attention to technique, adequate screenage both of primary and secondary  $\beta$  rays, and intermittency of irradiation, the skin over the affected area is but very little affected. Evidence of ossification is seen in radiograms at about the third week of treatment and continues in a progressive manner for six months or more. The end-result is an inert ossified mass. Although it is premature to judge the end-results of such cases, especially as regards visceral metastasis, the local results are good, and cases have now been traced for periods varying from two to eight years after the initial treatment.

**Pituitary Tumours.**—The favourable response of certain types of pituitary tumours to X-radiation has led to an attempt at treating some of these cases with radium. Radiation in addition to surgery is indicated in those cases where recurrence of the tumour is anticipated, or in cases of cysts of the pituitary where the lining is to be destroyed. At first gold or platinum seeds were used: these present certain disadvantages—namely, the difficulty of accurate distribution and the tendency of all the seeds to fall to the bottom of the sella turcica. With the object of obtaining uniform irradiation, Percy Sargent and Stanford Cade have elaborated a method by which intrasellar and suprasellar tumours can be irradiated with accuracy. The seeds are replaced by a single- or double-barrelled capsule made of silver 1 mm. thick. Each capsule is filled with ten or twelve millicuries of radon, and placed in position after evacuation of the contents of the sella by means of suction (*Plate LII*).

REFERENCES.—<sup>1</sup>*Lancet*, 1930, ii, 286; <sup>2</sup>*Acta Radiol.* 1931, Sept. 30; <sup>3</sup>*Brit. Jour. Radiol.* 1931, Dec., 48; <sup>4</sup>*Lancet*, 1931, i, 1237; <sup>5</sup>*Med. Jour. of Australia*, 1931, March 21, 326; <sup>6</sup>*Ibid.* 1930, Nov. 15, 652; <sup>7</sup>*Lancet*, 1930, i, 16; <sup>8</sup>*Brit. Jour. Surg.* 1931, April, 622; <sup>9</sup>*Ibid.* Jan., 501; <sup>10</sup>*Med. Res. Council*, 1931: *Medical Uses of Radium*, Special Report No. 160; <sup>11</sup>*Lancet*, 1931, Nov. 14.

**RAYNAUD'S DISEASE.** (*See SYMPATHETIC NERVOUS SYSTEM, SURGERY OF.*)

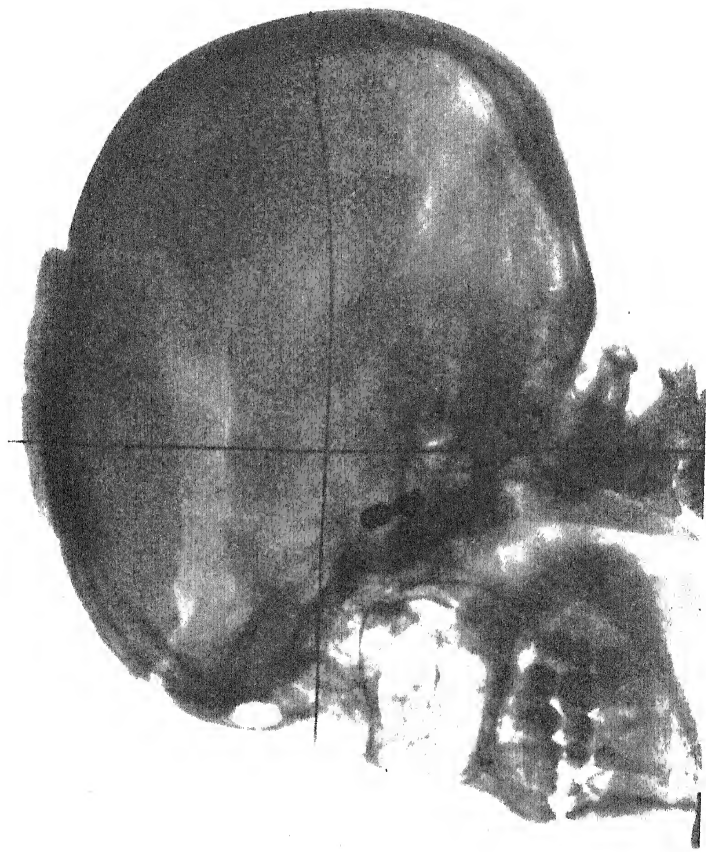
## RECTUM, CANCER OF.

J. P. Lockhart-Mummery, F.R.C.S.

A large number of papers have appeared during the year on various aspects of this subject. The necessity of being able to make quite certain of a diagnosis before deciding to operate does not need stressing. While clinical diagnosis as the result of a careful examination and observation of the tumour is very reliable, it is not sufficient, as some innocent tumours may imitate a cancer so closely as to result in mistakes. The only really certain method is by removal of a small portion of the tumour for histological examination. W. B. Gabriel<sup>1</sup> describes how this can be done by means of special forceps through a speculum or sigmoidoscope without causing any pain to the patient or necessitating an anæsthetic. He also discusses the reliability of the findings from such small specimens. In forty cases the diagnosis of cancer was verified from the piece

*PLATE LII*

RADIUM TREATMENT OF PITUITARY TUMOUR







removed. Three to six pieces are removed from each case and sent to the histologist. No complications have resulted from this method and it does not cause any difficulty.

At St. Mark's Hospital an attempt is also being made to classify the tumours according to their grade of malignancy by Broders' method previous to operation, but there is not yet sufficient evidence that the findings can be relied upon.

L. Norbury,<sup>2</sup> in his presidential address at the Subsection of Proctology of the Royal Society of Medicine, reviewed the literature of multiple primary growths of the rectum and colon. He pointed out that they are not so rare as is often supposed, and may easily give rise to serious mistakes in diagnosis. A large number of cases of more than one malignant growth being present in the same patient are quoted, and the etiology of the occurrence is discussed. Many of the cases are the result of polyposis intestini, or multiple adenomatosis, which is a familial disease.

W. Shedden<sup>3</sup> points out the necessity of treating all simple adenomatous tumours of the rectum and large gut as potentially malignant, and urges the necessity of keeping a careful watch on such patients for recurrence for some years after an operation for their removal.

H. Saltzstein and D. Sandweiss,<sup>4</sup> in discussing the difficulties in the diagnosis of cancer of the rectum and colon, give an interesting analysis of the results of X-ray findings in such cases. They analyse the results in 166 cases of cancer of the colon (leaving out the rectum), and find there was an error of 22 per cent in the X-ray findings. This shows that X-ray findings cannot be relied upon, and that a negative X-ray diagnosis must not be trusted in arriving at a decision in any case of suspected cancer of the colon. They also find as the result of analysing the symptoms in 260 cases that in two-thirds of the rectal cancers there was an early period in which symptoms are chiefly tenesmus, pain on defecation, and ache in the lower sacral region, before the appearance of blood in the stools.

P. Hayden and W. Shedden<sup>5</sup> give the result of a careful analysis of 303 cases of cancer of the rectum diagnosed clinically between 1912 and 1928. They summarize their conclusions as follows: (1) Adenomatous polyps constitute the most dangerous precancerous lesion. (2) The fifth decade of life shows the greatest incidence of cases. (3) A family history of cancer is obtained in only 7 per cent of cases. (4) Change in bowel habits, bleeding, and rectal pain should always suggest the possibility of cancer even though hemorrhoids also are visible. (5) Digital rectal examination is sufficient to make a diagnosis in 95 per cent of all cases. (6) Every cancer of the rectum is operable if discovered early enough, and the period during which it remains operable is longer than in most other cancers. (7) Obstruction necessitating emergency colostomy is rare in rectal cancer. (8) Colostomy, as an adjunct to radical operation, is always necessary. (9) In the entire series only 21 cases who had positive pathological reports of cancer are alive without symptoms, and *all* have had complete operations. (10) A radical resection by one of several methods, and including colostomy, offers the patient his best, and, they believe, practically his only chance of cure. (11) Radical operation definitely prolonged the life of 42 who subsequently died of recurrence. (12) Radium and X rays, as at present used, must be considered purely as palliative agents in the treatment of cancer of the rectum. (13) Patients receiving no treatment lived about the same length of time, on the average, as did those irradiated. Changes in technique of application may, in the future, improve this situation. (14) Surgical diathermy is of use in reducing the bulk of an inoperable growth.

**Operative Results.**—F. Dannheisser<sup>6</sup> reviews 168 cases of carcinoma of the rectum treated in the Nürnberg Hospital in a period of six and a half years.

Of these 51.8 per cent were inoperable. He favours the route from behind, both on account of the lower immediate mortality and because the incidence of cure was higher than with the more extensive abdomino-perineal route.

E. Berla<sup>7</sup> reviews the result of 35 operations. He concludes that the more radical abdomino-perineal excision should be reserved for exceptional cases.

T. E. Jones<sup>8</sup> reports 40 cases of cancer of the rectum treated by a one-stage abdomino-perineal excision, with a death-rate of 12.5 per cent.

F. Lahey<sup>9</sup> describes a two-stage method of abdomino-perineal excision for cancer of the rectum. He divides the pelvic colon at the first stage and establishes a permanent colostomy with the upper proximal end, and implants the distal end into the lower part of the abdominal incision. At the second stage this is dissected free again and sutured before proceeding to remove the whole rectum by the ordinary abdomino-perineal procedure.

Ernest Miles<sup>10</sup> discusses the treatment of inoperable cancer of the rectum, and concludes that colostomy is the best treatment and should be performed as early as possible and not left till late.

**Radium Treatment.**—Sir Charles Gordon-Watson<sup>11</sup> concludes that sufficient evidence has been obtained to show that an early growth of the rectum can be destroyed with radium without colostomy, or with a temporary colostomy, and without permanent interference with function, although as regards recurrence no observations exist on a five-year basis. He concludes that with the evidence at present available we are not justified in preferring radium treatment to surgical removal, although an exception may possibly be made in the case of epithelioma of the anal margin. A discussion on this subject was opened by Sir Charles Gordon-Watson at the Subsection of Proctology of the Royal Society of Medicine last year,<sup>12</sup> and the speakers, who included Dr. Lacassagne of Paris, Stanford Cade, J. P. Lockhart-Mummery, and Lionel Norbury, were unanimous in their view that the results of radium treatment for cancer of the rectum do not at present justify its use in preference to surgical removal, and that it should be reserved for cases which for one reason or another are inoperable.

J. P. Lockhart-Mummery<sup>13</sup> says that it is not generally realized that, provided cases of cancer of the rectum are treated early enough, modern surgery gives a very good chance of a permanent cure. It is often thought that patients with cancer of the rectum cannot be cured, but this is far from being the case. He gives a table showing a number of patients surviving operation seven years or more:—

Patients surviving operation	7 years or more	56
" " "	10 " " "	28
" " "	15 " " "	5

As cancer of the rectum is a disease of late life it is obvious that very long periods of survival can only occur exceptionally. Out of 300 cases operated on by the perineal operation the results on a five-year basis were:—

Cures	..	..	84
Recurrences	..	..	82
Died from other causes	..	..	11
Untraced	..	..	3

This gives a proportion of cures on a five-year basis of roughly 50 per cent.

REFERENCES.—<sup>1</sup>*Brit. Med. Jour.* 1931, Jan. 10; <sup>2</sup>*Proc. Roy. Soc. Med.* 1930, Dec., 198; <sup>3</sup>*New Eng. Jour. Med.* 1931, Jan. 1; <sup>4</sup>*Ann. of Surg.* 1931, Jan., 336; <sup>5</sup>*Surg. Gynecol. and Obst.* 1930, Dec., 783; <sup>6</sup>*Beitr. z. klin. Chir.* 1930, cxlix, 525; <sup>7</sup>*Clin. Chir.* 1930, 1; <sup>8</sup>*Jour. Amer. Med. Assoc.* 1930, Oct. 18, 1172; <sup>9</sup>*Surg. Gynecol. and Obst.* 1930, Nov., 692; <sup>10</sup>*Ibid.* 1931, Feb., 554; <sup>11</sup>*Ann. of Surg.* 1931, Jan., 467; <sup>12</sup>*Proc. Roy. Soc. Med.* 1930, Aug.; <sup>13</sup>*Lancet*, 1931, 1, 1025.

PLATE LIII

VILLOUS TUMOURS OF THE RECTUM

(R. BENSUADE, A. CAIN, AND A. LAMBLING)

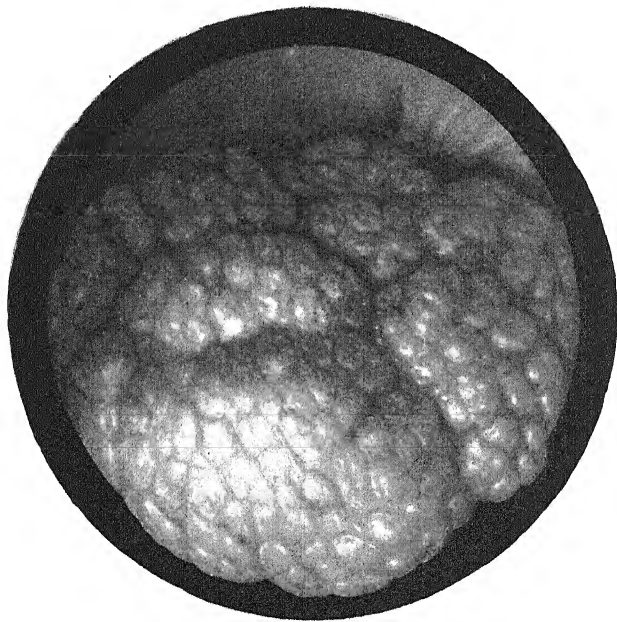


Fig. A.—Benign villous tumour.

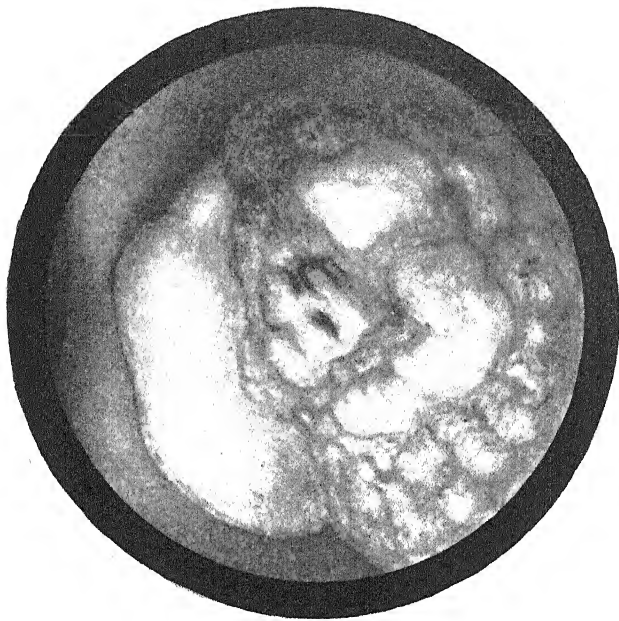


Fig. B.—Villous tumour becoming malignant.

*By kind permission of 'La Presse médicale'*



**RECTUM, INFLAMMATORY STRICTURE OF.***J. P. Lockhart-Mummery, F.R.C.S.*

Schreiner-Bienert<sup>1</sup> discourses of the causes and treatment of inflammatory strictures of the rectum. He concludes that stricture of the rectum may result from any form of chronic inflammation. He finds such strictures are more frequent in women, and attributes this to: (1) The spread of inflammation from the genital organs; (2) That there are greater chances in women of infection of the pelvic floor due to genital infection, difficult labour, and direct injury of the rectum from childbirth. (3) In women there is a communication between the vaginal venous plexus and the rectal plexus, which may act as a direct path of infection.

He discusses the question of a syphilitic origin for these strictures, and agrees with most modern authorities in thinking that the cause of inflammatory strictures is usually a non-specific form of ulceration. He describes 14 cases, 12 women and 2 men. In only 5 of these cases could the etiology of the stricture be definitely established. In 2 cases it followed gonorrhoeal ulceration, in 2 chronic proctitis, and in 1 necrosis of the tissues after cauterization. In the other 9 cases no definite cause could be found. Three cases were treated by dilatation with bougies and two by internal proctotomy. Two cases were treated by diathermy and internal proctotomy and were apparently cured. Colostomy was performed in 8 cases. Two cases treated by bougies had afterwards to be operated on by resection of the stricture from behind after removal of the coccyx. The author concludes that the best treatment is **Colostomy**.

REFERENCE.—<sup>1</sup>*Deut. Zeits. f. Chir.* 1930, Sept., 105.

**RECTUM, NON-MALIGNANT TUMOURS OF.***J. P. Lockhart-Mummery, F.R.C.S.*

H. E. Hullsiek,<sup>1</sup> in a paper on adenomatous polyps, points out the high incidence of malignancy in this condition. The chief symptoms in his own cases were irritation, a discharge, prolapse, bloody diarrhoea, a sense of something in the bowel, and pain in the bladder. He considers adenomatous polyps as all pre-malignant and advises immediate removal.

W. Shedden<sup>2</sup> reviews the recent literature on adenomatous tumours of the rectum and colon. He points out that there is no fundamental difference between the different types as regards their origin, with the exception of the fibrous polyp which results from inflammation due to piles or ulceration. He stresses the danger of removing such tumours from the colon by snares, etc., owing to the fact that a hole in the bowel wall may result, and he quotes Greenwood's case where the tumour had actually involved the peritoneum, so that its removal resulted in a large gap in the bowel wall, which had to be stitched up with difficulty. He rightly advises that the removal of solitary adenomata from the colon should be done by laparotomy, or at least be preceded by an examination of the colon from the peritoneal aspect, or disaster may result from opening the peritoneal cavity. He strongly emphasizes the importance of keeping a careful watch on all patients from whom an adenoma has been removed, as recurrences are common and malignancy often supervenes.

R. Bensaude, A. Cain, and A. Lambling<sup>3</sup> describe different types of innocent tumours and their treatment (*Plate LIII*). They maintain that the treatment of villous tumours of the rectum is before everything the province of the surgeon. Radium and radiotherapy at most produce a superficial improvement in the tumour, and recurrence is rapid. Treatment by electrocoagulation and fulguration, which is so successful in cases of villous tumours of the bladder, is not so successful in rectal tumours. After many treatments it is possible to get the tumour to disappear, but recurrences are frequent, and it

is most difficult to judge the area destroyed. Very often small polyps remain which rapidly produce new tumours. Also at the base of the tumour there is often an indurated spot which requires many applications, and this is liable to produce neoplastic degeneration of the area in question. In one of their cases a tumour which had previously been innocent in character and had been cured, recurred after a year as a definitely malignant growth. In another case the tumour became malignant after several treatments.

Surgical excision is the only efficient treatment. There are three methods of choice :—

1. *Removal by Local Resection.*—Most tumours where there is no malignant degeneration can be treated by this method. The most favourable cases are those where there is a single narrow pedicle. It is important that the tumour should be in such a position that it can be brought down low enough, and that anal dilatation will offer a satisfactory method of getting at it. The anæsthetic plays an important rôle. The authors recommend an anæsthetic which obtains complete relaxation of the sphincter muscle, such as spinal anæsthesia, so that tumours at 12 to 14 cm. can be reached. General anæsthesia does not afford such good facilities. Local anæsthesia is completely rejected as it does not give sufficient relaxation of the sphincter. The healthy mucosa surrounding the growth should also be removed in addition to the growth and its pedicle. Recurrence is liable to occur in a few months if this is not done. Fifteen cases were operated on by this method, with 2 recurrences, one after a year, and the other after eleven years. The latter, a man, had a large circular villous tumour freely resected by the transanal method in 1916. In 1927 he returned with an extensive recurrence, also innocent in character.

2. *Resection or Rectal Amputation by the Perineal Method* should be used for very large spreading growths, or those that are already showing signs of malignant degeneration. Although amputation is the most simple operation and gives the lowest mortality (6 to 8 per cent) it condemns the patient to incontinence, and rectal resection is the best method. It preserves the sphincters, yet permits of sufficient removal of the mesorectum and glands.

3. *Rectal Amputation by the Abdominal or Abdomino-perineal Route.*—This should only be used in exceptional cases of very large tumours, tumours in the rectosigmoid, or where there is already evidence of malignant change.

REFERENCES.—<sup>1</sup>*Minnesota Med.* 1930, 229; <sup>2</sup>*New Eng. Jour. Med.* 1931, Jan. 1, 5; <sup>3</sup>*Presse méd.* 1930, Dec. 13, 1713.

## RECTUM, PROLAPSE OF.

J. P. Lockhart-Mummery, F.R.C.S.

In the treatment of incomplete prolapse in children which does not respond to non-operative treatment, C. P. G. Wakeley<sup>1</sup> advises **Cauterization** with the actual cautery or fuming nitric acid. Linear eschars are made in the mucous membrane and carried well out on to the skin at the anal margin. In cases where cauterization has failed he advocates excision of portions of the prolapse. Two or four diamond-shaped portions of mucous membrane and skin in the long axis of the bowel are removed and the sides of the incisions sutured together so as to form longitudinal cicatrices. Complete **Excision** of the prolapse by **Whitehead's Operation** is advised in more advanced cases. The peritoneum is opened and the cut edge is sutured carefully to the peritoneal coat of the bowel, and afterwards the mucous membrane of the rectum is sutured to the skin edges. Lastly he advises Lockhart-Mummery's operation of **Rectopexy**, by opening up the retrorectal space and packing the back and sides of the rectum with gauze in cases of bad prolapse which cannot be cured by the simpler operations described, or in adults where complete prolapse already exists.

REFERENCE.—<sup>1</sup>*Clin. Jour.* 1930, Oct. 29.

# RECTUM, RESTORATION OF, AFTER INJURY, BY THE INVAGINATION METHOD. J. P. Lockhart-Mummery, F.R.C.S.

M. G. Jean<sup>1</sup> describes the case of a young man of 24 who had ruptured his pelvirectal colon and had had an artificial anus for nine years. Jean wished to restore the continuity of the bowel and close the artificial opening, but was confronted with the difficulty that the stump of the rectum was too short to make any ordinary form of anastomosis possible. It was decided to use the Mummery tube method of invagination. After the abdomen had been opened the descending colon was freed by dividing the peritoneum, and it was then found to be long enough to reach the anus. The rectal stump was opened from the abdomen and a rubber drainage tube tied into the distal end of the colon and pushed into the rectum from above, the end being drawn out of the anus by an assistant until the end of the colon projected from the anus. The colon wall was fixed to the rectum at the bottom of the pelvis as well as possible by sutures, and an intussusception formed by pulling on the tube through the anus. The pelvis was drained. There was a threatened obstruction on the sixth day owing to œdema of the invaginated bowel, but this passed off and the patient made a good recovery with perfect function of the restored bowel. [This danger of obstruction from œdema of the invaginated bowel occurred in several of the earlier cases, but has been got over by using a rubber tube which passes through the invaginated portion of bowel and ends at least 5 or 6 in. higher up in the colon.—J. P. L.-M.]

REFERENCE.—<sup>1</sup>*Bull. et Mém. Soc. de Chir.* 1930, Dec. 13, 1302.

# RENAL DISEASE. (See also KIDNEY: PYELITIS AND PYELONEPHRITIS.)

S. W. Patterson, M.D., D.Sc., M.R.C.P.

The following divisions of the subject are those upon which recent work of interest has been published.

**Classification of Renal Disease.**—A. von Korányi<sup>1</sup> (Budapest) divides diseases of the kidney into two large groups: (1) *Unilateral*, in which the diagnostic methods used are those of the urological specialist, and the treatment is mainly surgical. To this group belong the affections of the pelvis of the kidney (see PYELITIS and PYELONEPHRITIS); focal disease of the kidney—for example, infection with tubercle, animal parasites such as hydatid, and carcinoma or hypernephroma; also, abnormalities such as polycystic disease, displaced and movable kidney. (2) *Bilateral* kidney disease and disturbance of renal function. In this group the special diagnostic methods of the urologist are rarely needed, and the treatment is essentially medical. As a subdivision of this group may be included orthostatic or functional albuminuria; and the conditions leading to circulatory disturbance or congestion of the kidney, such as occur in heart disease, hypo- and hyperthyroidism, diabetes insipidus, and albuminuria following apoplectic and epileptic attacks; the most important part of this group is composed of the bilateral diseases of the kidney which are known collectively as Bright's disease.

D. D. Van Slyke and others,<sup>2</sup> (New York), in an admirable paper which will be referred to again later, following in the main the classification of Volhard and Fahr, recognize three chief types of nephropathy, of which the outstanding differential characteristics are: (1) Hematuria, acute, intermittent, or chronic, usually with hypertension, and with nitrogen retention, frequent in the acute stage, almost invariably present in the advanced chronic stages; (2) Hypertension, which precedes any serious renal signs; and (3) Œdema and heavy proteinuria without hæmaturia or hypertension. These three conditions are characterized by Volhard and Fahr as glomerulonephritis, nephrosclerosis, and nephrosis respectively, while Addis describes them as hæmorrhagic,

arteriosclerotic, and degenerative Bright's disease. The special and primary histological changes observed in the three conditions are respectively: (1) Inflammatory glomerular destruction; (2) Thickening of the small renal arteries; and (3) Degeneration affecting mostly the tubules. These are the primary and characteristic changes, although material obtained at autopsy frequently or even usually presents in varying degree additional secondary changes. It will be seen that the second and third divisions coincide roughly with the old classification into chronic interstitial and chronic parenchymatous nephritis, while the first division (hæmorrhagic) includes acute nephritis and its sequelæ, subacute and chronic nephritis. Signs of tubular involvement with heavy deposit of degenerated and fatty epithelial cells and casts point to a purely degenerative condition, but concomitant slight affection of the glomeruli, connective tissue, and vessels cannot be excluded. The diagnosis of pure nephrosis is therefore difficult, and cases are rare, though genuine nephrosis is probable when the urine has a very high content of albumin, epithelium, and fat, and the œdema fluid contains lipid and reduced amount of protein.

Recent work on kidney disease has tended not to force cases into a rigid classification, but rather to estimate what portions of the kidney are affected in each individual case. Involvement of glomeruli and raised arterial tension occur in nephritic and nephrosclerotic conditions; raised tension occurs also in diseased states of the epithelium of the glomeruli, such as sublimite kidney. Hæmaturia is a nephritic symptom. When it occurs without rise of arterial tension, it points to focal or slight nephritis; with raised tension it indicates diffuse nephritis. It will be seen below that defective clearance of the blood-urea leads to uræmia, whilst altered plasma protein content, plasma albumin deficit, leads to œdema.

**Diagnosis of Renal Incapacity.**—Methods of estimating renal capacity may be grouped as follows, according to the function of the kidney which it is desired to test: (1) Chemical and microscopical examination of the urine, especially for the presence of albumin and cellular elements, is the standard method of testing the condition of the kidneys. (2) The ability of the kidneys to maintain water balance between intake and output, and the inability to excrete concentrated urine in chronic nephritis, are the basis of numerous clinical tests dealing with the specific gravity of the urine. (3) The excretory capacity of the kidneys is measured by the ability to excrete either substances which are eliminated without a threshold, such as indigo-carmin and phenol-sulphonaphthalein, or threshold substances, of which urea is the one most employed. (4) The ability of the kidneys to keep the non-protein or urea nitrogen of the blood at a normal level.

**Urine Analysis.**—Though for the purposes of observation on metabolism and nutrition a twenty-four hour collection of the urine is required, a sample of which is usually submitted for examination, H. Paillard<sup>3</sup> (Vittel) points out the advantages of a fresh specimen of urine for study of the bacteriology, the presence of casts and crystals in the deposit, and the need for freshly passed urine in determining the acid-base equilibrium. He does not find it necessary to have catheter specimens. At Vittel patients come to the laboratories between 2 and 4 p.m. to pass urine into sterile flasks, and the specimens are examined between 4 and 6 p.m. After the mid-day meal is the best time to secure specimens, because the urine is abundant, relatively concentrated, and most likely to contain sugar and albumin. For the determination of albumin, the best-known tests are heating with acetic acid, and Heller's nitric acid ring test. R. A. Behrman<sup>4</sup> (New England) compares Folin's sulphosalicylic acid test with Heller's test, to the advantage of the former, which



gives a better differentiation of a 'trace' for insurance purposes. W. B. Clapp and B. Cohen<sup>6</sup> (Grafton, U.S.A.) advocate a ring test with phenol for albumin, which is sensitive to 0.004 per cent albumin, and does not give pseudo-reactions with oxalates, uric acid, phosphates, and urates. The reagent consists of 7 parts of 10 per cent phenol, 1 part of glycerin; urine is slowly pipetted on to the reagent in a test-tube; in the presence of albumin a distinct white ring forms between urine and reagent; there are no colour rings as in Heller's test with nitric acid. A rapid clinical method for estimating protein in urine has been worked out by P. M. T. Kerridge<sup>6</sup> (London). The urine is mixed with a carbon suspension; protein and carbon are precipitated by trichloroacetic acid; the greyness of the precipitate depends on the amount of protein, and is estimated by comparison with a series of standards. The time taken is three to four minutes only, comparing favourably with the inaccurate and delayed reading with Esbach's reagent.

*Functional Albuminuria.*—R. S. Palmer<sup>7</sup> (Boston) states that functional, orthostatic, postural, or transient albuminuria is not an unusual finding. Most observers of large series report an incidence of 5 to 10 per cent. In children it is less common among the well-cared-for. Cases may be classified as follows: (1) Malnutrition albuminuria, usually associated with anaemia and often some focal infection; (2) Orthostatic or postural albuminuria; and (3) Idiopathic or 'growth' albuminuria, including under this head the so-called juvenile, pubertal, cyclic, transitory, or intermittent albuminurias. To these groups may be added (4) Albuminuria after severe muscular exercise in athletes and army recruits.

Functional albuminuria appears by day and is absent at night; it is often transient, but it may be accompanied by hyaline and even granular casts and a few red blood-cells. It is not always typically orthostatic. It occurs characteristically in weak, nervous, and delicate individuals, but not necessarily so. Its importance lies in making a correct diagnosis and in appreciating the prognosis. Palmer followed up 174 cases of young people showing albuminuria on routine examination at Harvard University, and compared the results with 147 normal subjects examined about the same time. Previous infectious diseases apparently played no part in the etiology of functional albuminuria; a larger percentage of underweight individuals and of those with a family history of vascular disease was found in the albuminuric series. Lumbar lordosis was not an important factor, as poor posture was equally common in the two groups. The pathogenesis is not clear, but is probably local and may be the result of stasis producing a local acidosis. No treatment is indicated, though apparently functional albuminuria can be prevented by alkali administration. Palmer concludes that slight traces of albuminuria in young male adults without other signs of renal disease are of comparatively little significance, persisting after eight years in only one of 35 cases followed; and that individuals exhibiting this sign should not be excluded from normal physical exercise.

*Tests of Renal Function.*—A full review with practical details of the various methods of testing renal function appeared in the MEDICAL ANNUAL of 1929.<sup>8</sup>

F. S. Hansman<sup>9</sup> (Sydney) discusses the numerous tests that have been evolved, and concludes that on the whole some form of *urea-concentration test* is the most satisfactory. The test is carried out as follows: The patient restricts his intake of fluid for thirty-six hours and takes no fluid or food for twelve hours before the test. After 15 grm. ( $\frac{1}{2}$  oz.) of urea dissolved in 100 c.c. (3 oz.) of water have been swallowed, the bladder is emptied each hour for three hours. These three samples and the urine passed before taking the urea are examined for urea, specific gravity, and creatinine. Hansman has carried out

this test on 103 cases and followed up their subsequent course. He concludes that no concentration below 3 per cent should be considered as indicating unimpaired function. In addition he recommends that the blood-urea, -creatinine, and -cholesterol should be estimated, and the urine examined for albumin, specific gravity, deposit of casts, red blood-cells, leucocytes, and crystals. The normal range of values is as follows :—

Blood-urea.—15 to 40 mgrm. per 100 c.c. blood.

Blood-creatinine.—0 to 1.5 mgrm. per 100 c.c.

Blood-cholesterol.—100 to 175 mgrm. per 100 c.c.

Urea-concentration factor  $\left(\frac{\text{urine-urea}}{\text{blood-urea}}\right)$ .—60 or more (that is, the kidney

should be able to concentrate urea at least sixty times).

Urea-concentration test.—The normal values are :—

TIME	UREA PERCENTAGE	SPECIFIC GRAVITY	QUANTITY IN C.C.	ACIDITY	ALBUMIN
Before	1.5 upwards	1010 upwards	—	+	—
1 hour	1.5 upwards	1006 upwards	less than 150	±	—
2 hours	2.5 upwards	1010 upwards	less than 100	±	—
3 hours	3.0 upwards	1015 upwards	less than 80	±	—

Urea in the urine is usually estimated by the hypobromite method in the urea-concentration test. D. Leys<sup>10</sup> (Cardiff) states that it is impossible to estimate urea excretion by the hypobromite method when there is a combination of bacilluria and acidosis, though bacilluria alone does not appreciably affect the result. Whenever urea excretion is estimated in patients whose urine gives a positive nitroprusside reaction for ketone, excess of ammonia is present in the urine. It should be allowed for by estimating by the formalin method, and subtracting 2.6 c.c. nitrogen for every 0.1 per cent ammonia found.

French authors, following Ambard, have devised various formulæ for estimating the renal capacity from the *concentrations of urea in blood and urine*. These elaborate calculations have not been taken up by English and American workers. T. Addis<sup>11</sup> (New York), by comparing the ratio of urea in a one-hour specimen of urine with that in 100 c.c. of blood, after giving the patient large doses of urea and fluids, believes one can estimate the amount of functioning kidney tissue. This test, by working the kidneys to fullest capacity, is a true measure of renal function. D. D. Van Slyke<sup>12</sup> (New York) estimates the blood-urea clearance, i.e., the volume of blood cleared of urea per unit of time, the formula used being :—

$$\text{Standard blood-urea clearance} = \frac{U}{B} \sqrt{V}$$

U is the concentration of urea in the urine, B is the concentration in the blood, and V is the volume output of urine in cubic centimetres per minute.

The estimation of blood *non-protein nitrogen* is inadequate at the time when such tests are most needed—that is, at the early stage of reduction of renal efficiency, since the activity of 50 per cent of the kidneys is enough to remove the nitrogenous wastes at the normal rate. Thus the non-protein nitrogen of the blood is not raised until the disease has put out of action at least half of the kidneys. Retention of *creatinine* in the blood is a constant accompaniment of advanced cases of nephritis, and the degree of retention may be taken as an index of the degree of renal damage or impairment of kidney function. The normal amount of creatinine in the blood varies from 1 to 2 mgrm. per

100 c.c., and increase of blood-creatinine above 5 mgrm. per 100 c.c. points to a serious impairment of the excreting power of the kidneys and indicates a grave prognosis. Creatinine is excreted three times as readily as urea in the normal subject. C. L. Cope<sup>13</sup> (Oxford) finds that in the nephritic subject the impairment of creatinine excretion approximately parallels that of urea excretion. A. M. Crawford<sup>14</sup> (Glasgow) found that the urinary creatinine was low in 9 cases of nephritis that ended fatally. Creatinine tests are not much used now.

Recently there have been many attempts to introduce simplicity into the tests of renal function. A test requiring only measuring the portions of urine and noting their specific gravity is that known as the *dilution and concentration test*. The fasting patient passes urine at 7 a.m. and then drinks 1 to 1½ litres of weak tea or lemonade. Samples of urine are taken every hour for four hours, then two-hourly for the next eight hours. Ordinary dry food is allowed during this time, but no further fluid till twelve hours are over. The normally functioning kidney excretes the litre or more of fluid taken in four hours, and the specific gravity falls to 1000 to 1003 in at least one of the first four portions. During the afternoon hours the quantity of urine diminishes and the specific gravity rises to 1025, at least in one portion. C. D. Brink<sup>15</sup> (Bloemfontein) finds this test satisfactory. R. W. Buck and S. H. Proger<sup>16</sup> (Boston) have performed the test in a hundred patients and compared the results with other tests of renal function. The advantages of the test are its sensitivity, its ease of performance, no special laboratory equipment or technical ability being required, and its applicability to patients not confined to bed. F. H. Lashmet and L. H. Newburgh<sup>17</sup> (Ann Arbor) prepare their patients for three days with a standard diet, then all intake of fluid and food is stopped from 6 p.m. till noon next day. The specimen of urine passed between 10 a.m. and noon is examined for specific gravity. They thus have a standard waste for the kidney to excrete during a time when it is forced to function at its maximal capacity. This test detects a lowered function of the kidneys long before either the phenolsulphonephthalein excretion test or the estimation of the blood non-protein nitrogen.

I. M. Rabinowitch<sup>18</sup> (Montreal) insists, and all physicians of experience will agree, that whatever laboratory tests are used, the whole clinical aspect of the patient must be taken into account in assessing the nature and outlook of cases of renal disease. The value of laboratory methods of investigating kidney disease lies in the light they have thrown on the function of the healthy and diseased kidneys. Special tests are appropriate for special renal diseases, and kidney function tests are especially useful as an indication of the amount of recovery of renal efficiency. For practical purposes, and because it can be carried out by the general practitioner, he advocates the *renal test meal*. This is a simplification of the method of Lashmet and Newburgh, in that the patient is allowed his ordinary meals during the day but takes no food between meals. The urine is collected every two hours, and the volume and specific gravity of the different specimens are estimated. Under normal conditions, the findings are: (1) The volume of the urine varies inversely as the specific gravity; (2) There is at least a nine point difference between the highest and the lowest specific gravity values during the day; and (3) The volume of the night urine is usually not more than 400 c.c. In nephritis, the earliest finding is a tendency towards a fixation of specific gravity at a high level, the values ranging between 1020 and 1025. As the impairment of kidney function progresses, the specific gravity becomes more fixed, tends to be lower, and the volume of the urine during the night increases. With much impairment of renal function, the specific gravity is fixed at a low level, between 1010 and 1012, and there is

nocturnal polyuria (hyposthenuria of Korányi). These changes are shown diagrammatically in the chart (*Fig. 99*). In acute nephritis when the œdema is rapidly diminishing one may find polyuria and low specific-gravity values; at this stage, such a finding indicates improvement rather than impairment of renal function.

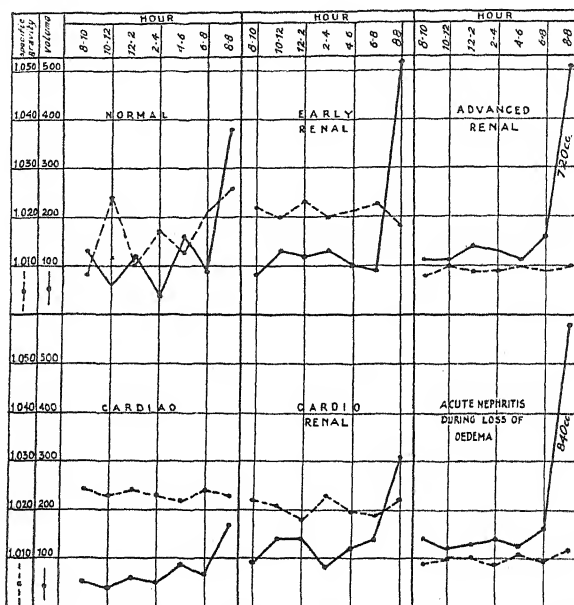


Fig. 99.—Chart showing results of renal test meal for the estimation of renal efficiency in 6 cases—normal, early renal, advanced renal, cardiac, cardio-renal, and acute nephritis during loss of oedema. (Redrawn from the 'Canadian Medical Association Journal'.)

**Nephrosis.**—Amongst the degenerative diseases of the kidney, formerly known as chronic parenchymatous nephritis, modern research has tended to differentiate a special group of cases for which the term 'nephrosis' may be adopted. T. Izod Bennett, E. C. Dodds, and J. D. Robertson<sup>19</sup> (London) repeat what are considered to be the essential findings in 'nephrosis' when this term is used in its strict sense. From the clinical point of view these cases show a condition of chronic or relapsing œdema, with no cardiovascular changes; thus there are no retinal changes, no rise of blood-pressure, and no cardiac hypertrophy. Biochemically they are characterized by heavy albuminuria and absence of hæmaturia; oliguria is usually present, but there is no suppression of urine; doubly-refractile lipoids are often observed in the urine; the basal metabolic rate is reduced; the blood chemistry shows only (1) reduction of the plasma proteins, mostly at the expense of the albumin fraction, and (2) frequently great excess of cholesterol. These authors report two cases of pure nephrosis which died of an intercurrent infection (pneumococcal peritonitis). A third case in which a fatal termination took place is reported by Izod Bennett,<sup>20</sup> who mentions that during the last twelve months details of about fifteen other cases have been recorded in the literature. One such is fully recorded by H. Moore and W. R. O'Farrell<sup>21</sup> (Dublin); this patient responded to treatment with a Diet rich in protein, with restricted fats and

unlimited carbohydrates, moderate restriction of salt, and about 1200 c.c. of fluid a day. Diuresis was procured by **Ammonium Chloride** followed by a few single doses of **Salyrgan** (2 c.c.) intramuscularly.

L. Leiter<sup>22</sup> (Chicago), reviewing the subject of nephrosis, concludes that it is a rare chronic disease of children and young adults, usually insidious in its onset, and without any definite relationship to infectious diseases in most cases, although in some the condition seems to follow chilling, upper respiratory infections, or active lues. The underlying cause is unknown, though O'Meara<sup>21</sup> (Dublin) suggests that there is justification for suspecting a bacterial origin. It may be pneumococcal, since many cases succumb to intercurrent infections with that organism. The course is typically chronic, with remissions during which all the signs and symptoms, except albuminuria, may disappear. Complete recovery may occur after months or years of an up-and-down course. Often, however, the general state of the patient is such as to predispose him to various acute and chronic infections, particularly ones pneumococcal in origin, the outcome of which is likely to be fatal. The morphological picture, limited to a characteristic degeneration of the renal tubules, distinguishes nephrosis from any other type of renal disease, especially from chronic glomerulonephritis, which may, at some stage in its course, produce a strikingly similar clinical picture. The heavy albuminuria appears to be due to a primary renal lesion altering the permeability of the renal capillaries to the plasma proteins; and the œdema of nephrosis is probably closely related to the reduction in the plasma proteins, whether due to renal loss or disturbance in formation.

**Renal œdema.**—O. L. V. De Wesselow<sup>23</sup> (London) points out that it has long been recognized (from the time of Bright onwards) that a dropsical condition of the body is frequently associated with albuminuria and definite renal lesions. The types of renal disease in which such œdema is met with are: acute and chronic glomerulonephritis, the kidney of pregnancy, the amyloid kidney, and especially the nephrotic kidney—or, as we used to call it, the 'kidney of chronic parenchymatous nephritis'. On the other hand, gross renal damage may occur without œdema ensuing. For instance, in chronic interstitial nephritis (including the arteriosclerotic kidney), in polycystic disease, and in pyelonephritic lesions, no œdema is present. Similarly, even when excretion of water completely ceases, as in total nephrectomy, or in bilateral cortical necrosis, œdema does not develop. Broadly speaking, the œdematous group of renal lesions presents two distinctive features: in the first place the amount of protein lost in the urine tends to be large, and, secondly, oliguria is characteristic of renal lesions associated with dropsy, though oliguria in itself is in no way evidence of inability of the kidney to excrete water. The older theories of renal œdema postulated either an actual failure of the kidney to excrete water, or an inability of the kidney to excrete chloride or basic ions, with a secondary retention of water, since without such retention the salt concentration of the body fluids would be so disturbed that life would become impossible.

Neither of these *retention theories* is able to withstand the criticism of experimental work on the subject. The modern theories of œdema, which assign the retention of water to some disturbance in the interchange of water between the blood and tissue spaces, are based on the experimental work of Starling, and fall into two main groups. In the first it is assumed that the blood loses water to the tissues either in virtue of some change in its own composition, or owing to abnormal permeability of the capillary walls. In the second it is assumed that the capacity of the tissues for attracting water is in some way increased. The interchange of water between the blood and tissue spaces is conditioned by: (1) the blood-pressure driving fluid out, (2) the osmotic pressure of the plasma proteins sucking fluid in, (3) the unknown factor of

capillary permeability. In renal œdema, blood-pressure changes apparently play no part in its production, but we have seen that a heavy loss of protein in the urine is characteristic of nephritic lesions associated with œdema. Such a loss leads to a fall in the concentration of the plasma protein, from which the urinary protein is derived. The loss mainly falls on the albumin, the smaller molecule of which escapes more readily through the damaged epithelium, the globulin being held back. "As urea retention in nephritis is the sign of a condition leading to uræmia, so is plasma albumin deficit the sign of a condition leading to œdema" (Van Slyke and others<sup>24</sup>).

In 75 nephritic patients N. S. Moore and D. D. Van Slyke<sup>24</sup> (New York) found that when the total protein content, normally averaging 7 per cent, falls below 5.2 to 5.8 per cent, or the albumin, normally averaging 4.3 per cent, falls below 2.3 to 2.7 per cent, or the plasma specific gravity, normally averaging 1.027, falls below 1.0225 to 1.0235, œdema is usually present. That the tendency to œdema formation is closely related to plasma albumin deficit and relatively unaffected by globulin changes is explained by Govaerts' finding that the albumin exerts four times as much osmotic pressure per gramme as the globulin.

T. Izod Bennett, E. C. Dodds and J. D. Robertson<sup>25</sup> (London) have collected a series of cases of plasma-protein loss with œdema but without proteinuria. In these cases great loss of albumin from the blood took place owing to recurring ascites or extensive ulceration of the stomach, and subcutaneous œdema resulted, though the kidneys were healthy. Degeneration of renal epithelium does not result from plasma protein deficit, therefore. It is probable that in nephrosis there is a primary degeneration of the renal epithelium allowing wastage of plasma albumin, and that the renal lesion causes the alteration in the constitution of the plasma proteins. The theory that a change of nature of the tissue proteins causing them to attract and hold water is a factor in producing renal œdema (Loeb), has not gained support.

**Salt in Nephritis.**—The earlier theories of salt retention in nephritis postulated a primary retention of chloride, due to defective excretion of chloride by the kidney. Water retention and dropsy were thus secondary. Salt excretion is deficient in œdematous nephritis, and in nephrosis salt may be almost absent from the urine. C. Van Caulaert and P. Pêtrequin<sup>26</sup> (Strasburg) point out that a lack of plasma chlorides is found in certain cases of nephritis, usually cases of acute nephritis without œdema and with oliguria or anuria. In some of these cases the chlorides are found to be high in the tissue fluids and in the cerebrospinal fluids (*chloropexie tissulaire*). In cases with much vomiting and diarrhœa there is a true chloropenia. Lack of chlorides may experimentally bring about an accumulation of waste products in the blood—a uræmic state. Further work will show if therapeutic indications may be found in these results.

**Anæmia in Renal Disease.**—The familiar pallor of kidney cases has directed much attention to blood examination in renal disease. E. Becher<sup>27</sup> (Frankfurt a. M.), after a study of the literature and from his own observations, concludes that the pallor of nephritic patients is usually due to a true anæmia and not to spasm of cutaneous blood-vessels. The anæmia, of secondary type with low colour index, may be progressive. A reduction of hæmoglobin to about 70 per cent may occur without signs of renal insufficiency; but it is then usually due to intercurrent hæmorrhage or else is a common result of the underlying cause of the kidney lesion. In diffuse glomerulonephritis the anæmia may be due to injury of the bone-marrow, which tissue shares in the constitutional damage that is suffered also by the heart and retina. Severe anæmia with a hæmoglobin content of 50 per cent or less often accompanies

nephritis with renal insufficiency, and appears to be due to diminished blood formation, since signs of increased blood destruction are lacking. G. E. Brown and G. M. Roth<sup>23</sup> showed a definite prognostic significance of anaemia in nephritis. In a group of 139 cases, those with no anaemia showed in two and a half years 18 per cent mortality. Those with 60 to 85 per cent of normal haemoglobin content showed 46 per cent, and those with less than 60 per cent of haemoglobin showed 85 per cent.

H. O. Mosenthal and B. Ashe<sup>29</sup> (New York) discuss the question of **Transfusion of Blood** in Bright's disease in the light of a study of the literature and of their own observations on patients during the past eleven years. They conclude that transfusions of blood do not raise the blood-pressure, do not injure the kidney, and neither relieve nor aggravate uraemic symptoms. The principal indication for transfusion is for the relief of the progressive secondary anaemia accompanying impairment of renal function. Several successive transfusions are, as a rule, necessary to restore the haemoglobin and red blood-cells to an approximately normal level.

**Course and Prognosis of Bright's Disease.**—Van Slyke and others<sup>2</sup> report the results of clinical, chemical, and functional observations, continued for periods varying from a few weeks to several years, on sixty-seven patients with Bright's disease, haemorrhagic, sclerotic, and degenerative. They have observed that gradual decrease of urea-excreting ability frequently develops during the course of nephrosis, and that the disease may end in uraemia, the glomeruli being then involved in the degenerative changes. The data adduced support the belief of Volhard and Fahr and of Addis, that it is possible from observations during the course of the disease to deduce the general nature of the pathological changes occurring in the kidneys. In acute haemorrhagic nephritis the prognosis was found to be independent of the severity of the disturbances during the first weeks, with the single exception of the plasma-albumin content. The majority of the cases in which this fell to a low level became chronic. Intensity of haematuria, proteinuria, and degree of hypertension had no apparent relation to the probability of recovery. Fall of the renal function to as low as 10 per cent of normal, measured by the blood-urea clearance, was found not inconsistent with apparently complete recovery. By that test the majority of cases showed during the first two months a decided fall in renal function. In all the cases which recovered or improved, however, the blood-urea clearance began to rise within four months after the acute haemorrhagic onset. The occurrence or non-occurrence of this rise in renal function constituted the most definite single prognostic sign. After the initial acute stage of haemorrhagic nephritis a period was observed in some cases during which haematuria and hypertension disappeared, while proteinuria, plasma protein deficit, and oedema persisted. During this stage, these cases, except for their acute haemorrhagic history, were indistinguishable from nephrosis. In a few months, however, they either recovered or improved to the symptom-free latent stage, either of which was a relatively rare occurrence in the nephrosis cases, or else developed into chronic haemorrhagic nephritis. The tendency to non-cardiac oedema was found to parallel approximately the fall in albumin-content of the blood-plasma, except during the first weeks of acute haemorrhagic nephritis. Oedema during this period was repeatedly observed even when the plasma proteins remained normal. The oedema was, however, moderate and temporary unless plasma-albumin deficit developed. In all stages of nephrosis, plasma-albumin deficit and tendency to oedema occurred together. In arterio-sclerotic renal disease, plasma proteins were never markedly reduced, and only cardiac oedema was observed. Of the different features of the disease that were followed, the blood-urea clearance proved to be the most closely related to

the onset of final renal failure. The renal function, measured by the clearance, could apparently remain indefinitely at 10 per cent of normal without uræmia; but when it fell to below 5 per cent uræmia occurred and was usually fatal.

*Uræmia*.—A. A. Osman and H. G. Close<sup>30</sup> (London) insist that the term 'uræmia' should be applied only to those signs and symptoms which arise from, or at least are invariably associated with, defective elimination on the part of the kidneys; whether this be due to primary disease of these organs, a disturbance of their function secondary to disease elsewhere in the body (e.g., dehydration, heart or liver disease), or to mechanical obstruction to the flow of urine—in fact, to those symptoms arising from an insufficient depuration of the blood by the kidneys. Uræmia, therefore, can and does occur quite apart from Bright's disease. It is seen in its most typical form in cases with mechanical obstruction to the flow of urine and in cases of chronic nephritis in the young; for although uræmia, as shown by nitrogen retention, is frequently present in older subjects, death in these cases more often results from accompanying cardiovascular disease.

The chief signs and symptoms of uræmia may be conveniently considered under the heading of the main systems of the body involved. The onset is usually insidious, but may be rapid in acute nephritis, mechanical obstruction of the urinary tract, and in cases of chronic nephritis complicated by intercurrent infection, by bilious attacks, and following general anaesthesia. The initial symptoms vary, but physical and mental exhaustion, anorexia, vomiting, dyspnoea on exertion without signs of cardiac failure, anaemia, and progressive loss of weight are all common. In the nervous system true signs of uræmia are mental apathy and drowsiness, or intense mental activity, worry, and inability to concentrate; insomnia, which may be intractable despite physical weakness and fatigue; and muscular weakness, often with muscular twitchings. Headaches are often absent in uræmia, and if present differ from the intense headaches of hypertension and vascular disease of the brain. Vertigo, amaurosis, retinitis, transient paresis, hemiplegia, and convulsions are none of them necessarily manifestations of true uræmia, but are probably symptoms of coexisting hypertension and vascular disease. The only cardiovascular disorders which might be attributed to uræmic toxæmia are heart failure and toxic myocarditis, and perhaps pericarditis. A raised blood-pressure is not a sign of uræmia. It does not occur as a result of urinary obstruction, and is often absent in cases of chronic interstitial nephritis or secondary contracted kidney in young persons, and in chronic ascending nephritis or pyelonephritis in older people. In cases of chronic nephritis, too, where the blood-pressure has been high, a terminal fall of the pressure, not necessarily due to heart failure, often occurs. In the alimentary system, loss of appetite, nausea, and vomiting frequently occur in uræmia. The tongue may remain clean. A urinous or ammoniacal odour of the breath is a late occurrence, so are bleeding from the gums and loosening of the teeth. Either constipation or diarrhoea may be present, but neither is of diagnostic importance. Increasing dyspnoea on exertion may be the earliest symptom, even in cases without heart failure or severe anaemia. Persistent hiccup and other irregularities of respiration are late signs. Profound anaemia of secondary type is sometimes the earliest manifestation of chronic progressive uræmia. Progressive loss of weight not due to other ascertainable causes should excite suspicion of uræmia and call for an investigation of the blood. Laboratory methods are of much value when combined with sound clinical experience. Osman and Close favour an estimation of the blood-urea, using a simple urease method. The normal blood-urea is 15 to 40 mgrm. per 100 c.c.; in elderly subjects 50 to 60 mgrm. may not be abnormal. With low protein diet the normal figures are lower. A high



blood-urea may occur in heart failure apart from kidney disease, and after general anaesthesia. In chronic glomerular nephritis death from true uræmia occurs more often in the young, the elderly succumbing chiefly to hyper tension and cardiovascular disorders.

**TREATMENT.**—In discussing the treatment of nephrosis and all those chronically albuminuric and œdematous patients with 'Bright's disease', Leiter<sup>22</sup> claims that the first general principle of therapeutics should be to do no harm. In patients with nephrosis or the nephrotic syndrome, moderate activity (including work), normal diet, and the building up of an increased resistance to infection constitute the appropriate régime when œdema or other disabling features are absent, or present to such a moderate degree (œdema of the ankles at the end of the day, etc.) as not to be significant. The general nutrition of the patient is always to be given the first consideration. Albuminuria cannot be treated, but can be over-treated, when it is made the excuse for limiting the protein intake. Epstein purposely advocated a high protein diet, 150 to 200 grm. daily, to compensate for the loss of albumin. His system has perhaps not justified the original claims made for it, but its chief service has been to remove the fear of meat, eggs, cheese, and other protein-containing foods from the minds of physicians and patients. Rest in bed is essential when the œdema has reached a certain degree or tends to increase. Restriction of salt and fluid intake is important, and may lead to successful diuresis, prevent further swelling, and prolong the remissions. Rapid accumulation of abdominal or pleural fluid may call for paracentesis. Of the various diuretics, the purine group ordinarily produce no effect other than unpleasant gastro-intestinal upsets, in contrast to their usefulness in cardiac œdema. While the saline diuretics have little effect, **Urea** has usually an excellent diuretic action in patients with nephrotic œdema. It must be given in large doses, 20 to 100 grm. (1 to 3 oz.) daily. **Thyroid** is often useful, and 1 to 5 gr. of the extract may be given daily for weeks without producing toxic effects. The acid-forming diuretics, **Calcium Chloride**, **Ammonium Chloride**, and similar substances, may lead to definite and prolonged diuresis. **Mercurial Compounds**, such as merbaphen (novasurol), and salyrgan, given parenterally in combination with ammonium chloride or nitrate by the mouth, often lead to excellent results in patients in whom other diuretics fail. Mechanical removal of subcutaneous œdema fluid may be carried out, but only under conditions of strictest asepsis. One of the diagnostic features of nephrotic œdema, however, is its recalcitrance. Equally characteristic is the tendency to sudden overwhelming diuresis when the situation may look bleakest. The consensus of opinion is that decapsulation of the kidneys is useless.

**Treatment of Other Forms of Nephritis.**—The reaction of the blood and tissue fluids is slightly alkaline, and any gross change of reaction is incompatible with life. The beneficial effects of alkalis and the deleterious effects of acids on the kidney have been recognized from Bright's time onwards. D. M. Lyon, D. M. Dunlop, and C. P. Stewart<sup>31</sup> (Edinburgh) hold that *diets* containing an abnormal preponderance of acid- over base-forming foods may be a factor in the production of kidney disease or in increasing an already existing nephritis. They have carried out a series of experiments with different diets in cases of chronic azotæmic nephritis. The quantity of protein in each diet was kept constant; by varying the type of protein, diets were arranged that were mainly basic (vegetable and milk foods), mainly acid (fish, eggs, bread, and cereals), and with high purine content (liver, sweetbreads, meat, and kidneys). They conclude that in cases of chronic azotæmic nephritis the administration of a basic diet brings about clinical improvement, whereas an acid diet either fails to

cause improvement or exacerbates the condition. The clinical improvement or otherwise is paralleled by variations in the blood and urine chemistry. A. A. Osman<sup>22</sup> (London) finds that **Alkalis** may be used with advantage in many types of nephritis, but should only be used where a preliminary estimation has shown a decrease in the plasma bicarbonate. They may be useful for the production of diuresis and the control of œdema in: (1) The later stages of subacute nephritis with persistent œdema and without much hæmaturia; (2) Chronic parenchymatous nephritis, including its late stage; and (3) Chronic 'mixed' nephritis—that is, cases with œdema and some nitrogen retention. Alkalis are contra-indicated in the early stages of acute nephritis with hæmaturia—that is, in acute nephritis, during exacerbations (with hæmaturia) of chronic nephritis, unless controlled by estimations of blood bicarbonate; in the presence of myocardial degeneration and cardiac arrhythmia; and when there is persistent vomiting and considerable dyspnoea.

W. Ewig<sup>23</sup> (Berlin) reports that **Diathermy** of the healthy kidney causes increased diuresis, and recommends its use in acute glomerular nephritis; he gives twice daily a two-hour period with a current strength of 3 or 4 amperes. From his own observations G. Illyés<sup>24</sup> recommends **Decapsulation of the Kidneys** in cases of acute glomerulonephritis resistant to medical treatment; in chronic nephritis the results are poor.

**Congenital Polycystic Kidney.**—F. W. Schacht<sup>25</sup> (Mayo Clinic) studied 74 cases which died. In most cases of polycystic kidney, significant or persistent hypertension is present. There is thickening of the wall of the arterioles and of the small arteries of the kidney. The high incidence of retinal sclerosis in these cases indicates that the process probably is associated with a generalized vascular disturbance. The question of renal efficiency in polycystic disease is discussed by Hansman<sup>9</sup> (Sydney). Of seven cases confirmed by operation all had a blood-urea above normal, and of five urea-concentration tests only one reached a concentration of 2.5 per cent in any hour.

REFERENCES.—<sup>1</sup>*Nierenkrankheiten*, Berlin, 1929; <sup>2</sup>*Medicine*, 1930, Sept., 257; <sup>3</sup>*Presse méd.*, 1931, May, 699; <sup>4</sup>*New Eng. Jour. Med.*, 1931, March, 551; <sup>5</sup>*Ibid.*, 1930, Dec., 1237; <sup>6</sup>*Lancet*, 1931, i, 21; <sup>7</sup>*Jour. Amer. Med. Assoc.*, 1931, May, 1559; <sup>8</sup>*Med. Annual*, 1929, 408; <sup>9</sup>*Med. Jour. of Australia*, 1930, Sept., 415; <sup>10</sup>*Lancet*, 1931, i, 296; <sup>11</sup>*Jour. of Biol. Chem.*, 1923, Feb., 105; <sup>12</sup>*Jour. Clin. Invest.*, 1928, 427 and 485; <sup>13</sup>*Quart. Jour. Med.*, 1931, July, 567; <sup>14</sup>*Lancet*, 1930, ii, 1177; <sup>15</sup>*Clinical Jour.*, 1931, Jan., 6; <sup>16</sup>*New Eng. Jour. Med.*, 1930, Dec., 1283; <sup>17</sup>*Jour. Amer. Med. Assoc.*, 1930, June, 1883; <sup>18</sup>*Canad. Med. Assoc. Jour.*, 1931, June, 785; <sup>19</sup>*Quart. Jour. Med.*, 1931, Jan., 239; <sup>20</sup>*Lancet*, 1931, i, 115; <sup>21</sup>*Brit. Med. Jour.*, 1930, ii, 242; <sup>22</sup>*Medicine*, 1931, May, 135; <sup>23</sup>*Liverpool Med.-Chir. Jour.*, 1930, ii, 197; <sup>24</sup>*Jour. Clin. Invest.*, 1930, 337; <sup>25</sup>*Lancet*, 1930, ii, 1006; <sup>26</sup>*Presse méd.*, 1931, June, 934; <sup>27</sup>*Munch. Med. Woch.*, 1930, Sept., 1657; <sup>28</sup>*Jour. Amer. Med. Assoc.*, 1923, 1948; <sup>29</sup>*Amer. Jour. Med. Sci.*, 1930, Oct., 476; <sup>30</sup>*Brit. Med. Jour.*, 1931, i, 1064; <sup>31</sup>*Edin. Med. Jour.*, 1931, Feb., 87; <sup>32</sup>*Lancet*, 1930, i, 945; <sup>33</sup>*Deut. med. Woch.*, 1931, Jan., 51; <sup>34</sup>*Zeits. f. urol. Chir.*, 1929, 298; <sup>35</sup>*Arch. of Internal Med.*, 1931, March, 500.

## RENAL GLYCOSURIA. (See DIABETES.)

## RESUSCITATION. (See HEART, ARREST OF, IN SURGICAL OPERATIONS; HEART FAILURE.)

## RETINA, DETACHMENT OF. W. S. Duke-Elder, M.D., F.R.C.S.

In the MEDICAL ANNUAL for 1931 (p. 411) mention was made of the new method introduced by Professor J. Gonin, of Lausanne, for the treatment of detachment of the retina by **Ignipuncture**. It was pointed out that in the type of retinal detachment in which a hole was present in the retina, this operation appeared to present a fair chance of accomplishing a cure; and when it is remembered that the great majority of detachments are characterized by the

presence of a hole, that their treatment has hitherto been practically hopeless, and that their almost invariable end-result has been blindness, the importance of the new technique will be readily realized. Naturally, the method has excited a considerable amount of interest in the condition during the past year, and since more experience has been gained of it and many more reports have been issued on various aspects of the subject, it may be valuable to review the position.

The etiology of retinal detachment still remains one of the obscure problems of pathology, and so it must remain until the physiology of the eye and the intra-ocular pressure has been more fully elucidated. Our knowledge of this has, it is true, increased very considerably during the past few years, but until the results so far obtained have been consolidated and the mechanism of normal function has been further amplified, our conceptions of the abnormal must remain essentially speculative. Most recent thought, however, is tending to divide detachments into two main classes: in one of which the retina is intact and in the other it is torn. A tentative scheme of the pathology of these two types may be suggested. The first type occurs typically in such conditions as a sarcoma of the choroid or retinitis (a noteworthy instance being the albuminuric retinitis of pregnancy)—any condition, in fact, in which the choroidal capillaries are dilated. It is known that the sentient layers of the retina are nourished from the choriocapillaris, and that, to effect this, fluid is continuously dialysing from the latter to the former. If now, owing to the increased permeability of the capillary walls, this fluid contains a considerable amount of non-diffusible proteins, it will tend to be retained in the subretinal space where it is surrounded by membranes through which colloids pass only with difficulty. As a result of this the retina is detached, and since the protein material in this fluid cannot readily escape, osmotic considerations tend to make the retention of the fluid permanent; the detachment, therefore, remains. In a similar manner recent work has shown that a trauma of some magnitude involves a dilatation of the capillaries and an exudation of protein-rich fluid, and therefore involves the possibility of a detachment. It can, however, be stated with a fair degree of confidence that contusions (unless they are very severe) do not as a general rule cause a detachment of the retina unless the eye is already diseased.

The second type is much more common, and the etiology is more obscure: nevertheless some facts are beginning to emerge. The essential precursor and primary factor in its causation in the great majority of cases seems to be degenerative changes, usually of a mild and chronic degree, occurring in the eye. These may be due to myopia or a chronic toxic process either acting alone or in combination. Recent work (Duke-Elder, 1930) has shown that the vitreous body is a homogeneous gel which may readily break down into a fluid condition, a circumstance which is associated with myopia or the action of a chronic toxin. In such a case the protein basis of the vitreous tends to separate out, sometimes in small discrete opacities, and sometimes, especially in the anterior region, in strands and pseudo-membranes. This material is derived embryologically from the retina, and frequently adheres to it more or less firmly; indeed, in pathological specimens the internal limiting membrane of the retina frequently appears to be associated more closely with the vitreous than with the retina itself. It is a frequent occurrence even in 'normal' eyes that areas of 'cystic degeneration' occur in the region of the ora serrata in late adult life, in myopia patches of degeneration are common, and in high myopia they are the rule, while a chronic infection frequently leaves small inflammatory foci in the choroid and the retina which give rise to no functional disturbance. It would appear probable that in such cases adhesions of coagulated vitreous

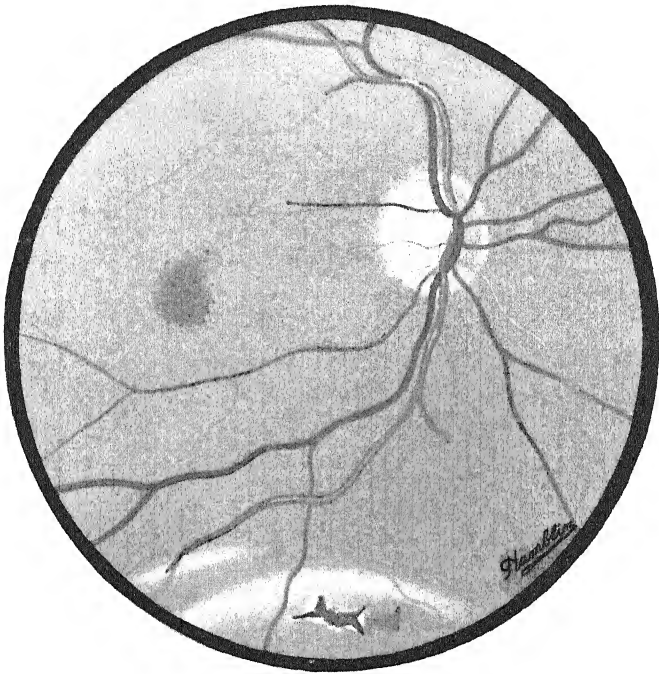
material are prone to form at these areas ; and since the vitreous itself is partially or wholly fluid, and since these adhesions determine well-defined lines of force within it, it is understandable that a trauma so light as almost to escape notice altogether (such as bending down, or a slight exertion) may produce a slight drag upon the point of adhesion sufficient to cause a tear in the degenerated area of the retina. Since the vitreous body in its state of degeneration is fluid and there is no resilient mass on the inner side of the retina to support it, the vitreous fluid can readily pass through the retinal tear, and there it collects, causing a detachment and extending it. In the first type of detachment, when no hole exists in the retina, and if the subretinal fluid can be absorbed, a reposition and cure is possible with rest and conservative treatment ; but in the second case, since vitreous fluid can continually pass through the tear, resolution is most unlikely so long as the latter exists. If, however, the tear is closed and intercommunication between the vitreous chamber and the subretinal space is denied, the fluid (unlike that in the first instance), having little or no colloid content, is rapidly absorbed in the course of a few days, and reattachment can occur. It is the closing of this hole by puncture with a cautery that constitutes the rationale of the new method of treatment. A typical example of such a hole is seen in *Plate LIV*.

The technique of the operation as devised by Gonin was described in the article in last year's ANNUAL, to which reference should be made (p. 411). During the past year, however, several suggested alterations have been put forward, none of which, it may be said at once, is of fundamental importance. There is no question that the great difficulty in the operation, and the point upon which success turns, is the accurate localization of the retinal hole. Gonin localized the hole by ophthalmoscopy as was described in the summary in last year's ANNUAL ; but several attempts have been made to make the process more accurate by mechanical aids. K. Lindner, of Vienna, has devised a method whereby the hole is first located with reference to the horizontal meridian by the Gullstrand ophthalmoscope fitted with a perimetric attachment. A small instrument consisting of a graduated ring which fits the corneal margin, and round which a pointer rotates, is sewn into the limbus, and the measurements are transferred to this directly from the readings on the Gullstrand ophthalmoscope. The principle is seen in *Plates LV, LVI*. The conjunctiva in the region of the hole is reflected and stitches are inserted into the limbus in the horizontal meridian (*Fig. A*). The ring is then tied in place, the pointer is set in the correct meridian (*Fig. B*), and the required distance along this meridian is marked on the sclera by a dye (*Fig. C*). Two non-perforating catgut scleral stitches are inserted around the spot, and the thermocautery is introduced (*Fig. D*). The cautery is then rapidly withdrawn, the stitches are tied, and the conjunctival flap is replaced (*Fig. E*). M. Salzmann has elaborated a perimetric method for the more accurate determination of the retinal hole ; and Amden employs a stylet apparatus to mark its localization on the outside of the sclera. Weve employs a more complicated device. The patient lies immediately under an inverted perimeter arm looking upward at its centre, and the hole is located by indirect ophthalmoscopy with an ophthalmoscope attached to the perimeter. When the hole is in the centre of the ophthalmoscopic field the direction of the arm of the perimeter and the position of the ophthalmoscope are mechanically fixed. The patient is then removed and an artificial glass-eye is put in the exact position occupied by his eye. The beam from the ophthalmoscope enters the artificial pupil and comes to a focus on the surface of the artificial globe at a point corresponding to the hole in the patient's eye. This point is measured off by an instrument similar to that employed by Lindner, which is then transferred to the patient's

PLATE LIV

DETACHMENT OF THE RETINA

(J. R. ANDERSON)



A typical detachment of the retina below, showing the presence of a retinal tear.

*By kind permission of the  
'British Journal of Ophthalmology'*

# PLATE LV

## DETACHMENT OF THE RETINA

(K. LINDBER)

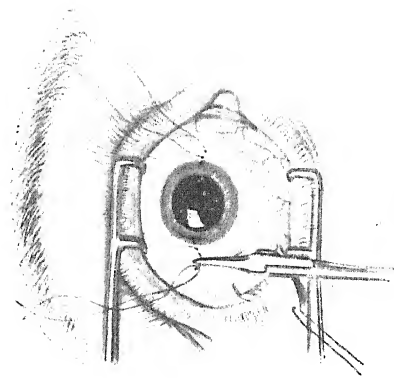


Fig. A.

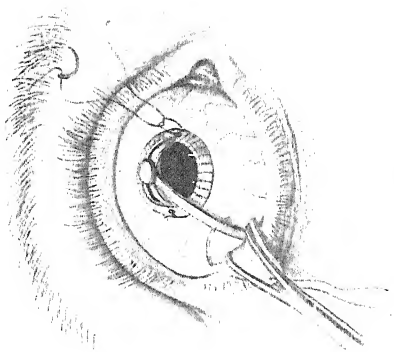


Fig. B.

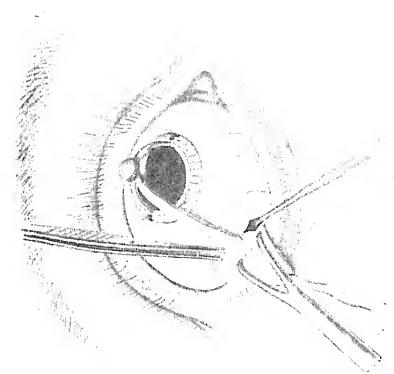


Fig. C.

Plates LV and LVI by kind permission of the  
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# PLATE LVI

## DETACHMENT OF THE RETINA—*continued*

(K. LANDNER)

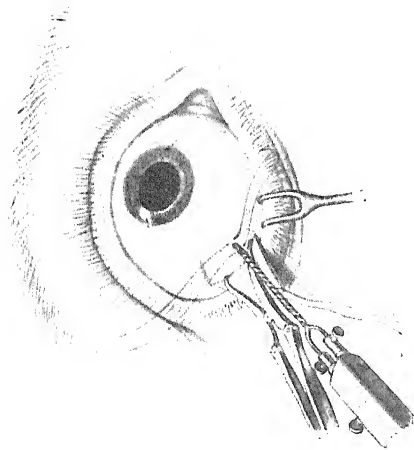


Fig. D

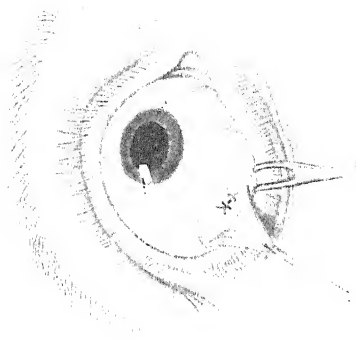


Fig. E.





eye, and the operation is begun. Ingenious though these methods are, however, it is hoped that something more simple and direct will yet be evolved.

An ingenious method on quite new lines has been suggested by R. Foster Moore. He has devised small gold studs which are inserted through a small incision in the sclera made at the spot which has been calculated, by whatever means, to correspond with the position of the retinal hole. The end of the stud is then identified ophthalmoscopically, either appearing through the retinal hole, or raising up the retina at some distance from it; in the latter case the exact position of the hole can be calculated from the position of the stud, and the cautery is inserted in the usual way at this point. Apart, however, from the trauma of inserting a stud through the walls of an already traumatized eye, this procedure suffers from the technical disadvantage of rendering the eye very soft. When the stud is withdrawn there is always some escape of vitreous, and the cautery puncture has to be carried out upon an eye which has partially collapsed, a procedure which may present some difficulties, especially in cases when a posterior position of the hole necessitates forcible rotation of the eye.

With regard to the actual cauterization there is some difference of opinion as to the technique. Some writers, such as R. Rubbrecht, consider that the retina can be attached to the choroid without the cautery entering the vitreous; M. Amsler considers that the cautery point should always reach the retina and vitreous. J. Meller makes an instantaneous puncture with a white-hot cautery so that the resulting scar is small, white, and flat, and he tries to avoid, if possible, the edge of the tear, to prevent puckering and consequent re-detachment. Lindner, on the other hand, uses a red-hot cautery, leaving it in the eye for ten to twenty seconds, and regards the scarring of the actual edges of the tear as all-important. Rubbrecht, after first making a scleral incision over 4 mm. in length, incises the dark choroid which bulges through so that the subretinal fluid escapes. He then cauterizes both edges of the incision for a distance of 5 to 6 mm. so that the inflammatory reaction may extend beyond the confines of the hole and make a broader and more solid adhesion without actually plunging the cautery point into the eye. It is probable, however, that, within limits, the degree of heat is of little moment, for contact with the fluids of the vitreous at once cools the cautery; and for this reason, no matter what technique is adopted, the area of the retina actually involved is relatively small. Moreover, in a histological study of which we shall speak again in a moment, G. Luntz has brought forward a considerable amount of evidence that so far as the final scar is concerned, it is immaterial whether the cautery is red hot or glowing white, or whether it is applied for two seconds or for twenty.

The rationale of the operation is presumably to allow the escape of the sub-retinal fluid and to seal the retina and choroid together by the inflammatory reaction which follows cauterization. A. Knapp considers that a coagulum is produced in the subretinal fluid which organizes and attaches the retina to the choroid. Others consider that a similar phenomenon occurs in the vitreous. M. B. Herzfeld has made microscopical observations of the results of experimental ignipuncture in rabbit's eyes. It was found that the retina was firmly attached to the choroid and that it was drawn up and somewhat striated and puckered. In his microscopical sections the only constant and definite observations were slight changes in the uvea and the sclera and little or none in the retina, a massing of uveal pigment at the point of retinal attachment with a round-celled infiltration, a necrosis of the sclera at the point of puncture with an infiltration of leucocytes here and in the neighbouring conjunctiva. Luntz has also made histological studies on the eyes of six rabbits and one monkey which had been subjected to experimental puncture. In five of the eyes which were removed five to seven days after the operation, the track of the puncture

was found to be filled with vitreous or blood ; no granulation tissue was present. The remaining two eyes were removed and examined after twenty-two days ; in these there was an ingrowth of episcleral tissue along the track. In all cases the sclera was necrotic for an area from 0.5 to 1 mm. around the hole, and the choroid was destroyed over a similar extent ; the retina, however, was reduced to an attenuated thin membrane for an area of 3.5 mm. It is possible that if such an attenuation commonly occurs it may explain the recurrence (which undoubtedly sometimes occurs) of further holes at a subsequent date in the same region. Amsler performed a similar histological investigation in a human eye on which an experimental cautery puncture had been performed upon a painful blind eye in a case of secondary glaucoma fifteen days before enucleation. In this eye there was a very extensive area of cicatricial vascular granulation tissue on the inner surface of the sclera extending over an area  $3.5 \times 5.0$  mm. around the site of the puncture. The presence of this tissue would undoubtedly provide the basis for a firm reattachment, which was further aided by the presence in this specimen of a thin band appearing in formalin fixation in continuity with the vitreous, holding the retina in contact with the cicatrix. It is obvious, however, that much more work must be done before any definite conclusions as to the rationale of reattachment of the site of puncture can be reached.

With regard to prognosis : immediate good results depend on : (1) the selection of suitable cases, (2) the accuracy of localization, and (3) the co-operation of the patient. With regard to the first desideratum, the case should not be of too long standing (three months' duration is stated as the maximum by the majority of writers, but in general terms the more recent the detachment, the more hopeful the prognosis), there should be small and few retinal tears which are accessible to cauterization, and the eye should be relatively healthy. Most important of all, it is probable, as we have seen, that the majority of detachments are associated with (and probably depend primarily on) disease of the uveal tract, and it is essential that the underlying cause of this should be assiduously tracked down and treated so far as is possible. With regard to the last desideratum, while a cure may be dramatic, it frequently happens that several holes exist, or one hole is not struck accurately at the first attempt, in both of which cases the patient has to submit to more than one somewhat trying operation with six to ten days' quietude after each. This is an experience which demands courage on the part of the patient, and patience and personality on the part of the surgeon.

During 1930, 75 patients with retinal detachment were submitted to the operation of cautery puncture by Gonin's method at Moorfields Eye Hospital. On these, 24 were discharged with the retinal detachment back and the visual field full ; 12 showed improvement either in the visual field or in the visual acuity ; the remaining 39 were unchanged or made worse. To obtain 32 per cent of cures and 16 per cent of improvements in such a serious and hitherto almost hopeless condition as detachment of the retina is indeed striking, especially as the method is entirely new and but little attempt was made to select cases in the first six months of the year. Gonin and A. Vogt claim approximately 50 per cent successes. Gonin, analysing his results of 250 cases, concludes :—

1. In more than 95 per cent of cases of retinal detachment, whenever ophthalmoscopic examination is possible, one or several holes may be detected in the retina if looked for with sufficient care.

2. In all recent cases, when the hole or tear has been closed, cure is immediate, complete, and permanent [*sic*].

3. In older cases (several weeks or months) closing the tear stops the

detachment and may produce a more or less complete reposition of the retina, but restoration of the vision generally remains incomplete.

4. If the detachment relapses, it is found that the tear has not been completely closed or that there was another tear which had not been previously seen.

5. A recurrence of the detachment in a different region of the eye is due to the formation of a new hole in the retina.

It is possible, however, that these results are over-sanguine. In Vienna, for example, where—especially at the Clinic of Professor Lindner—a very enthusiastic opinion was originally held as to the extreme value of Gonin's technique, it is being found that the good results are not being universally maintained. Recurrences of the detachment are beginning to appear, many of them owing to the formation of a fresh hole at or near the site of the original cautery puncture. In his own practice the reviewer (as yet) has had one such experience—that of a very high myope who was operated upon eighteen months previously. In cases when more than one operation has been found necessary, moreover, vitreous hæmorrhage at the site of the cautery scar tends to produce a vicious circle. These difficulties in Vienna have induced G. Guist to search for a somewhat less drastic procedure; and from experiments on rabbits he has found that *cauteri ation with a caustic potash stick* is milder and safer, and at the same time produces sufficient reaction to cause an adhesive exudate to seal the hole with little destruction of tissue. He has accordingly introduced an operation of which the essential points in technique are as follows. A conjunctival flap is dissected up and the sclera is trephined opposite the localized site of the retinal hole. After the hæmorrhage has been controlled a paraffin-mounted caustic potash stick, which has been freshly sharpened, is introduced into the trephine hole for one or two seconds, thus cauterizing the choroid. The reaction is then stopped by applying 0.5 per cent acetic acid on a moistened probe. The choroid is now perforated by a blunt probe, thus establishing contact with the subretinal space and allowing the escape of the subretinal fluid, without, however, touching the retina; and, finally, the flap is sutured into place. If the retinal hole is large, several trephine holes may be cauterized in a similar way without perforation of the choroid. At the time of writing, Guist's paper has just recently appeared, and the reviewer has had no opportunity of evaluating the technique.

So far as ultimate results of Gonin's operation are concerned, nothing can yet be said. The position may be summed up by saying that the prognosis of a detachment of the retina is always grave; but, in the case of recent detachments with a small and few accessible retinal holes in a relatively healthy eye, it is brighter to-day than it has ever been. Such cases should always have the benefit of operation. So much for the local condition in the eye. Since, as we have seen, a very large number of detachments are ultimately due to degenerative changes in the vitreous body and the retina, changes which follow from chronic uveal disease usually of an infective nature which may lead directly to a subretinal effusion or may indirectly involve a predisposition to detachment, it is necessary not only to attempt local operative procedures designed to produce mechanical restitution in the eye, but to go further afield, for uveal disease is due to some general morbid phenomenon. Because of the fundamental part played by uveal disease much of the pathogenesis of retinal detachment will remain unsolved so long as work in the field of general pathology is obscure, and the treatment of the condition must be considered inadequate in its insurance against the future unless every effort is made to trace and eliminate the ultimate origin.

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### RETINITIS PIGMENTOSA. (See SYMPATHETIC NERVOUS SYSTEM, SURGERY OF.)

### RHEUMATIC INFECTION IN CHILDREN. (See also TONSILS, DISEASES OF.)

Reginald Miller, M.D., F.R.C.P.

The literature dealing with juvenile rheumatism has received very many additions during the last two years, and these have taken the form not only of separate articles in the medical journals, but of reports and books. Viewing the subject as a whole, it must be said that the most interesting new work in all this output deals with the causation of the infection. And this is necessarily the case, for of all the problems still awaiting solution none is of more importance than that dealing with the circumstances of its causation, whether we are concerned with the infection as a great endemic disease amongst the children of this country, or with the infection of one individual child.

**Frequency and Distribution.**—The British Medical Association Committee on Rheumatic Heart Disease in Children in its two reports<sup>1 2</sup> pointed out that although it was probably right to regard juvenile rheumatism as essentially an urban disease, there was little evidence of a trustworthy nature bearing on the frequency of the infection amongst the children of strictly rural areas. At the instigation of Dr. Carey Coombs, a member of the British Medical Association Committee, a very arduous and difficult research was inaugurated covering the areas of Gloucester, Somerset, and Wiltshire, for the years 1927-30. With the invaluable help of many practitioners, the school medical officers, and the public health authorities, these counties were combed as efficiently as was practicable, and the cases refereed by a group of consulting physicians. In addition, the home circumstances of a number of control children were examined in order to compare them with those of the rheumatic children. Such a research as this obviously calls for immense trouble and enthusiasm, reflecting great credit on those who initiated and carried through their scheme. The results of the research appeared in the form of a report<sup>3</sup> signed by W. G. Savage, the County Medical Officer of Somerset. The report as a whole confirmed the view that rural children were less affected by rheumatism than those resident in industrial towns; but when it came to an attempt to decipher the various causative factors at work, the results were mainly negative. The conclusion of the report may be quoted verbatim:—

"From the point of view of the discovery of positive etiological environmental factors in the causation of rheumatic heart disease our results may seem disappointing in view of the immense trouble taken in their compilation. On the other hand, negative results have their utility, and the evidence which we adduce against any one environmental factor playing a significant part in the causation of rheumatic heart disease, is, in our opinion, a finding of material value. We are, moreover, continuing our inquiry into the distribution of these cases, and expect to report later as to the presence or absence of significant data emerging from these further investigations. Finally, we are of opinion that the striking contrast between the incidence of the disease in Bristol and in the surrounding country is a new fact of importance."

Since the publication of this important report, C. J. McSweeney<sup>4</sup> has recorded the results of investigations amongst the school children of Cardiff. He estimates that the proportion of children showing rheumatic heart disease in Cardiff is 5.82 per 1000 of school population compared with 7.72 per 1000 in the case of Bristol. Such figures may be compared with 1.28 for Bath, and 1.03 for Gloucestershire (including Cheltenham), and these results seem to confirm the view of the British Medical Association Committee that juvenile rheumatism is a disease of towns as opposed to country areas, and of industrial towns in particular. The importance of industrialization seems well brought out by these figures.

**Home Environment.**—An interesting sidelight has been thrown on the rheumatism problem by a research reported in the London County Council Medical Officer's Annual Report for 1930,<sup>5</sup> concerning the health of children living in basements. Various districts were tested, and there appeared to be a great increase in the amount of rheumatism in basement children as compared with those not living in basements. It was this point which first led the reviewer<sup>6</sup> to emphasize the importance of the home environment on the production of juvenile rheumatism, and it will be interesting if the L.C.C. authorities increase their present rather meagre figures concerning the health of basement children.

**Contagion.**—A good deal of attention has been paid to the possibility of juvenile rheumatism being in reality a disease communicable from patient to patient, although of low contagious virulence. It will be remembered that the Medical Research Council's report<sup>7</sup> (1927) dealing with juvenile rheumatism went very fully into this question, which, it was stated, was one of the chief points investigated. They found no convincing evidence of contagion, although many of the facts elicited were regarded as consistent with such a view. The general impression left on reading the report was that the theory of contagion was 'not proven' rather than 'not guilty'. At that time the present writer<sup>8</sup> put forward many arguments, which need not here be repeated, against the acceptance of contagion as a factor in the production of juvenile rheumatism. In the Milroy Lectures for 1930 J. A. Glover<sup>9</sup> claimed that juvenile rheumatism could be regarded as an infectious disease, the virus being conveyed by droplet infection. The evidence adduced in support of this view was by no means so strong as to be incapable of other interpretation. Generally speaking, this view appeals more strongly to those approaching the subject from the public health side than to the paediatric physician. W. Sheldon,<sup>10</sup> however, appears ready to lend the weight of his authority in support of it, and writes that "the element of infectiousness in acute rheumatism lies in the preliminary throat infection, and these throat infections may assume epidemic proportions." On the other hand, B. Schlesinger,<sup>11</sup> studying the same sort of material as Sheldon—namely, the outbreaks of active rheumatism among the children in a home for rheumatic heart cases—sees no necessity

to invoke an infectious rheumatic factor. After describing the circumstances of the outbreaks he writes that in them "a preceding infection was invariably discovered. It appears that this, rather than the rheumatism itself, was the infectious element." A. F. Coburn,<sup>12</sup> while apparently sympathetic towards this view, found that the introduction into a ward full of quiescent rheumatic cases of patients in acute phases was not followed by outbreaks of acute rheumatism among the convalescent rheumatic patients. On the other hand, he found, as so many others have found, that "patients in the hospital, stigmatized with the rheumatic process, developed recrudescences of their disease during epidemic ward infections." J. R. Paul,<sup>13</sup> reporting for the American Heart Association on the epidemiology of rheumatic fever, seems to think that ultimately the disease will be found to be infectious.

A work such as the MEDICAL ANNUAL, being published only once a year, is no place in which to conduct controversy: nevertheless, the question of the possible infectivity of juvenile rheumatism goes so deeply into the rheumatism problem that it is necessary to discuss it briefly. Were it proved that contagion plays any real part in the mass-production of juvenile rheumatism, we should need not only to reconsider our ideas of the bacteriology of the disease, but completely to reorganize our methods of combating it. It may be granted that an infection such as rheumatism, which shows such powerful environmental factors in its production, will certainly show in its epidemiology characteristics such as are compatible with case-to-case infection: the question is whether these are sufficiently reliable to cause us to revolutionize our ideas; for it must be allowed that hitherto there has been no tradition among paediatric physicians that juvenile rheumatism is a communicable disease in any sense of practical importance. Much attention has been paid, as has been pointed out above, to the 'outbreaks' of acute recrudescences of rheumatism in wards devoted to the nursing of rheumatic patients. The facts are not in dispute: it is their interpretation. When an epidemic catarrh or sore throat spreads in such surroundings from one child to another, it is presently followed by a crop of acute rheumatic relapses. Is this proof that the contagious sore throat was a rheumatic manifestation? If so, then rheumatism is a contagious disease. There seems, however, no need to take this line, for another disease with a communicable sore throat—namely, scarlet fever—will be followed by exactly the same sort of outbreak of fresh rheumatism, as F. J. Hector<sup>14</sup> has shown. Here there is no doubt that the communicable infection is not rheumatism, but a disease capable of lighting up rheumatism; and it seems reasonable to suppose that catarrhal throats, especially where they are associated with infection by hæmolytic strains of streptococci (W. R. F. Collis<sup>15</sup>), although not rheumatic, can stir up fresh rheumatism in a rheumatic subject in the same way as scarlet fever, or even diphtheria, can do. It is not necessary here to go into other arguments against the contagion theory, some of which the reviewer has dealt with elsewhere,<sup>16</sup> but it may be allowable to say that it took clinicians many years to realize that the production of juvenile rheumatism was not a mere matter of a child and a germ, and it looks as though public health workers will need to go through the same painful apprenticeship.

**Allergic Phenomena.**—It has always been something of a problem to account for the curious fact that acute rheumatism appears to be due, if we accept the streptococcal theory, to a micro-organism which habitually inhabits the alimentary tract as a harmless saprophyte. What is it that suddenly so alters it that it is capable of taking on a pathogenic role? It has been the custom to think of the streptococcus becoming in some way exalted in virulence, perhaps in the tonsils or elsewhere, and emerging into the blood-stream

endowed with pathogenic power. Recently, with the unfolding of some of the curious processes grouped as 'allergie', it has been suggested that the attack of rheumatism is not so much due to an exaltation in the virulence of the agent as to a state of sensitization to it on the part of the body tissues. This is a most interesting conception which would help to solve a great difficulty if it could be proved. B. Schlesinger,<sup>11</sup> working along these lines, has put forward the view that the silent period which is often observed between the initial sore throat and acute systemic symptoms is concerned with the development of sensitization in something the same way as the interval well known to occur between an injection of serum and the appearance of anaphylactic symptoms.

The whole question of streptococcal allergy in acute rheumatic infection has been investigated by R. A. Macdonald,<sup>17</sup> and his thoughtful and stimulating paper on the subject is worth careful study.

**Abdominal Symptoms.**—J. J. J. Giraldi<sup>18</sup> has called attention to the occasional occurrence of abdominal symptoms of moment at the onset of an attack of acute rheumatism. These he describes in three groups—digestive, pseudo-appendicular, and peritoneal. K. H. Tallerman<sup>19</sup> has also reported cases of the same type. Their clinical interest may be considerable, especially from the point of view of obviating mistakes in diagnosis, but their theoretical interest is certainly no less. It is generally allowed that the tonsils, or in a tonsillectomized child the pharynx, act as the chief source of entry of the rheumatic agent into the blood-stream; but as this process often cannot be traced it is thought that the intestinal tract is probably the next most frequent culprit in this respect, and it is, of course, well known that tonsillar sepsis and intestinal toxæmia often coexist. If acute abdominal symptoms, such as are described by Grimaldi and Tallerman, were common initial symptoms in an acute rheumatic attack, their significance would be fairly plain, comparable to the acute tonsillar symptoms where the throat is acting as the portal of entry. But acute abdominal symptoms seem hardly frequent enough for so much significance to be attached to them. On the other hand, slight digestive disorders are common enough in the very early stages of rheumatic infection, as C. W. Vining<sup>20</sup> has emphasized, and it may be that, as R. A. Macdonald<sup>17</sup> suggests, such a phase as this leads to sensitization of the child to streptococcal infection.

**Pulmonary and Pleural Lesions.**—The interesting work by A. E. Naish<sup>21</sup> on rheumatic pneumonia, or as he prefers to call it the 'rheumatic lung', was referred to in the MEDICAL ANNUAL for 1929 (p. 416). In the same year (1928) J. R. Paul<sup>22</sup> wrote on the same subject in America. L. Findlay<sup>23</sup> has published the findings in twenty-five cases of rheumatic infection in which there were pulmonary complications. He is of opinion that rheumatic pulmonary and pleural lesions are never primary, or at all events cannot be recognized as such, and if they make their appearance they are always associated with carditis. The most frequent pulmonary complication in children, he states, is pleural effusion, usually associated with pericarditis, and occurring on the left side. The effusion is of the nature of a transudate, containing endothelial cells largely. The strictly pulmonary lesions he divides into: (1) An inter-current disease (lobar pneumonia); and (2) Terminal hypostatic or bronchopneumonia complicating cardiac disease. He does not appear to have met a lesion which he recognizes as of the type described by Naish.

**TREATMENT.**—Acting on the theory that the rheumatic patient is hypersensitive to streptococci, H. F. Swift, working with others,<sup>24</sup> has tried to reduce this hypersensitivity by intravenous **Vaccination** with streptococci. The

results, considering the difficulty and complexity of the investigations, they regard as sufficiently favourable to warrant further elaboration of the method. They state that it is especially applicable to two classes of rheumatic patient—namely, those continuing a low-grade infection, and those temporarily free from symptoms but in whom relapses may be reasonably expected. The same group of investigators have given antistreptococcal serum a good trial, but their report<sup>25</sup> is not favourable.

N. Morris and S. Graham<sup>26</sup> produce biochemical evidence that the addition of **Alkali** in the administration of sodium salicylate is of definite value in preventing the non-gaseous acidosis that may develop under salicylate therapy. There is much of theoretical interest in their paper besides this practical point.

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## RHEUMATISM AND ARTHRITIS, TREATMENT OF.

Dr. J. van Breemen.

In the leading medical journals about 750 articles on rheumatism were published in French, German, or English, from January, 1930, to May, 1931. They have been registered and gone through by the International Bureau of the Ligue Internationale contre le Rhumatisme. With a few exceptions, writers, editors, or publishers were so kind as to give their work to the library on application. A small number of articles were sent us in other languages (Russian, Hungarian, Czech, Italian, Spanish, Dutch, Swedish, and Danish). Most of them cannot be analysed by the writer, as he has not full command of all these tongues. It is worthy of mention here that experience has taught us that the majority of these articles are published in French, German, or English sooner or later. Of these articles, about 70 are on medico-scientific work, about 170 on therapy, about 460 on clinical treatment and diagnostics, and about 45 are social. For practical purposes the writer has selected the articles on treatment for the present review.

No striking discoveries have been made. What still, however, makes a fresh impression is the greatly increased interest in the rheumatic problem. The fact that in 1928 the International Bureau collected only about 150 articles on rheumatism, whereas from the beginning of 1930 to the middle of 1931 the number was 750, may serve as an illustration. The number of publications is increasing by leaps and bounds each year. From the therapeutical point of view it is striking that of late years a considerably bigger place has been awarded in many countries to physical treatment in the widest sense of the word. In England, which had long manifested an intelligent interest in rheumatic morbid conditions, the surgical (anatomical) and bacteriological standpoints, as regards the study and treatment, have most decidedly been partially abandoned, while the clinico-physiological study and the treatment connected with it have won a lot of ground. That the General Medical Council has recognized the need for giving sufficient tuition to medical undergraduates in the fundamental principles of physical treatment is an important reason for optimism in respect of a deeper insight into the problem of rheumatism.



To those who wish to find their bearings in this field, the reviews in which Dausset (Paris), Gunzburg (Brussels), Ray (Red Cross Clinic, London), van Breenen (Amsterdam), Krebs (Aachen), Pap Lajos (Budapest), and Forestier (Paris) have given their work to consulting bureaux, or equivalent institutions, should be of great importance. The fact, moreover, that last year more than twenty articles drawing attention in a general way to the treatment of rheumatism saw daylight in England, Germany, and France clearly evidences an awakening interest and the abandoning of the nihilistic attitude adopted by many for years.

**General Physical Treatment.**—The International Congress on Physical Therapy at Liège, under Professor Gunzburg's presidency, gave a number of valuable communications on the treatment of arthritis and rheumatism by physical methods. Here it appeared that clinico-physiological conceptions in regard to the combating of rheumatic diseases were rapidly gaining ground. Undoubtedly pathological anatomy has been of great significance in the more effective differentiation of rheumatic illnesses, but for therapeutic purposes the deepening of our knowledge of pathological physiology is in this case of the greatest importance. The writer must restrict himself to these few remarks and refer to the *compte-rendu* of the Liège Congress. It is of essential medical significance that the vague conception of 'reaction' is nowadays much more accurately defined and better studied from the physiological standpoint than it was twenty years ago. The articles by Strasser (Vienna), Laqueur (Berlin), and Freund (Vienna), published in other places, point in exactly the same direction.

The splitting up of articles on physical treatment into different divisions is obviously rather arbitrary, because hydrotherapy and thermotherapy (for instance) have many points in common and are not always to be kept apart. Likewise the meaning attached to the conception 'radiology' differs in the various countries. Yet, in order to keep the review as practical as possible, it is desirable that a division should be made. Copying the system of the International Library on Rheumatism, we accept the following headings.

**Balneotherapy.**—Those who desire a review of the literature in the field of the balneological treatment of rheumatic diseases may be referred to the *Archives* of the International Society of Medical Hydrology, the mother society of the Ligue Internationale contre le Rhumatisme. In this periodical valuable paragraphs have appeared, both from the pen of the chief editor, Dr. R. Fortescue Fox, and from different collaborators. The important question of the best organization of a consulting bureau for rheumatic patients is also treated here.

From the French side a very good survey is given in Porecheron's journal, which treats of crenotherapy in particular; here an opportunity is found to bring into the foreground the treatment of rheumatic patients at French spas and the special methods applied there (at Aix-les-Bains, Dax, Bagnères, Bourbon, Bourbonne, etc.).

Ray gives a survey of balneotherapy as exercised in British spas. Kerr Pringle (Harrogate), Campbell (Droitwich), and Howitt (Tottenham) have given most readable reviews, too.

It is significant that in some countries (Hungary, Germany, etc.), efforts are being made to co-ordinate the scientific study of balneology and university training. As an expression of this Adolf Bickel's article is worthy of perusal. The papers read by Kormann (Ragaz), Neuda (Hall), Schober (Wildbad), Lieven, Schuster, Krebs (Aachen), and Schmidt (Pistany) deserve mention also. The articles by Françon (Aix-les-Bains) on "Les Cures hydrominérales françaises dans les Rhumatismes chroniques" can also be

warmly recommended as being an excellent objective contemplation of indications and contra-indications of French spas.

**Thermotherapy.**—The classification under this heading is rather arbitrary, as a great part of hydrotherapy and balneotherapy might also find a place here. We prefer to treat only hot-air therapy and radiant heat therapy here. The articles by Schmidt (Pistany) and Llewellyn Jones Llewellyn give very readable general outlines, while van Breemen (Amsterdam) in his pamphlet *The Use of Infra-red Rays in the Treatment of Rheumatic Patients*, has laid down a short summary of his researches and experience with theoretical considerations. Gunzburg (Brussels) gives a description of the apparatus used by him for heat irradiation (bain thermique infra-rouge).

**Hydrotherapy.**—It is striking how few articles have appeared in the last few years on hydrotherapy, if by this the treatment by means of baths or douches (not at a spa) is exclusively meant.

**Peat, Paraffin-wax, Fango Baths.**—Last year several writers published good medical articles on fango (medical mud), mostly volcanic or radio-active. Pisani (Florence) described the mud of Acqui; Roger and Larauza gave an analysis of the mud of Dax; Schmidt (Pistany) gave another description of the fango of Pistany; while Schestrikowa and Frenkel (Odessa) gave an analysis of the fango found on the coast of the Black Sea and investigated the effects of warm fango-applications on healthy animals, coming to the conclusion that both mud-baths and hot-water baths distinctly diminished the calcium percentage of the blood. Juergens, too, made an investigation on the influence of mud-baths on the blood-corpuscles in rheumatism at the Leipzig University Clinic. The conclusion arrived at is that after the peat-bath a high leucocyte proportion with neutrophilia and shifting to the left was fairly constantly found. Further, Schulhof (Héviz, Hungary) gives an outline of Hungary's medicinal fango, and Nadig (Val Simestra, Switzerland) of the radio-active mud in Val Simestra. Finally, Alexandroff (Moscow) discusses "mud treatment at home and in winter".

As regards the clinical aspect, all the writers are agreed that fango is an excellent cataplasma, which may undoubtedly in numerous chronic joint irregularities, when applied warm, give a considerable improvement in sufferers from arthritis and periarthritis based on capsule swellings and in cases where the soft parts are affected.

On the other hand, Kern (Vienna), who, under Freund's guidance, gave cold mud applications in Wenekebach's clinic in cases of acute arthritis, states that very good therapeutic results were obtained with this old, well-tried, popular remedy.

As to paraffin applications, which have of late years been brought into the market by various firms under different names, such as Zeressin, Ambrine, Paraffsam, no communications opening up new perspectives have been published since the original communication by Barthe de Sandfort, of Cannes. In some cases they are undoubtedly good cataplasms with a therapeutic action, but an investigation by Lampert (University Clinic, Koenigsberg) showed that in paraffin applications no higher temperatures are realized than in other thermic methods of physical treatment.

**Diathermy.**—It is a matter of taste whether diathermy is grouped with heat-therapy or electrotherapy; the writer would rather treat it separately. Generally speaking, it may be said that diathermy is used much more than most other physical curative methods, nay, that it is often misapplied in many cases where diathermy can be of little or no use and where other applications would be more suitable, *inter alia* in superficial rheumatic disturbances. On the other hand, not a single method is known which gives results comparable

to those obtained with diathermy in deeper irregularities, e.g., arthritis of the hip-joint. The number of publications on diathermy has been exceedingly great of late years. It is but seldom, however, that new fields of vision are laid bare. An excellent outline of diathermy in rheumatism is given by De Munter and Masy (Liège), while the father of the diathermic method, Nagelschmidt, made some important statements on diathermy with short rays and hyperthermy at the Liège Congress. Here wave-lengths of from 50 m. to 200 m. were used with a frequency of 6,000,000. In this way a stronger depth-action is obtainable, temperatures of 40° being attained for hours.

Diathermy was applied in some cases of chronic infectious arthritis in which lumbar sympathetic ganglionectomy had been done. A definite increase in the surface temperature of the upper extremities and also of the lower extremities was obtained (*see Publications, Staff Meeting of the Mayo Clinic*, January, 1930).

Cumberbatch (London) gave another summary of "The Uses of Diathermy in Medicine and Surgery"; special reference should be made here to his treatment of joint diseases. Bouwens (St. Thomas's Hospital) in a short article also points out the significance of diathermy in rheumatoid arthritis.

A new point of view is furnished by Bordier (Lyon) in his article "Le Traitement hydro-diathermique dans les Lithiases et la Diathèse arthritique", in which diathermic treatment is applied after a certain mineral water has been drunk. His statements are provisional, and he hopes to be able to supplement them soon.

**Massage, Vibration, and Medical Gymnastics.**—Kirschberg (Berlin) gave an excellent survey, at the International Congress on Physical Treatment at Liège, of the importance of massage in rheumatic affections of the muscles and joints. The well-documented article by Pemberton (Philadelphia) on massage (*Journal American Medical Association*, 1930, June) is also deserving of great interest. At the meetings of the Ligue Internationale contre le Rhumatisme at Liège and Amsterdam, Mueller (Gladbach) had an opportunity to demonstrate his own methods of massage and to explain them in his paper. Even if we cannot subscribe to all his conclusions, his conscientious study and observations over more than twenty years of numerous morbid conditions are undoubtedly of great moment.

**Light Therapy.**—The large number of publications on phototherapy in the last few years proves the great interest taken in it. The International Congresses of Light Therapy, first in Switzerland, afterwards at Paris, have opened up no new perspectives in rheumatic treatment. Dausset (Paris) and van Breemen (Amsterdam), as reporters, treated the influence of light treatment from different points of view. This much is certain, that the different forms of phototherapy are now among the most popular methods of treatment, and that in many cases, because the technique is so simple, light treatment is applied in bulk, frequently where other methods would be more suitable.

Furniss treats of the influence of light in rheumatism in connection with metabolic disorders. Gunzburg (Brussels) recommends combining ultra-violet general irradiation with local infra-red rays. Sir Henry Gauvain gives a general review of sunlight cures in England. Kirschmann (Berlin) emphatically states that it is impossible to conclude an irradiation cure according to a preconceived scheme, because individual sensibility differs right from the beginning and is greatly modified under treatment in different ways. The researches of Lignac (Leiden, Holland) showed that in dead skin, too, the formation of pigment takes place under the action of rays. Buckley (Buxton), at a meeting of the Section of Balneology and Climatology, gave an interesting survey of the influence of sunlight and other climatic factors on health

and in rheumatic diseases, rightly pointing out that hitherto the important influence of climate and weather in rheumatic illnesses has had but little methodical study. His conclusions are worthy of reflection. It would undoubtedly be of great significance if there were more systematic study of the influence of weather in rheumatism, but this study should be tackled internationally.

A communication by Hill is of practical consequence; he states that some patients with rheumatism who had been treated ineffectually with various sources of light for a long time showed a distinct improvement under *incandescent gas lamps*. The reviewer is of the opinion that the longer wave-length will probably be the main factor here.

**Radiotherapy.**—After the great number of articles of previous years on *radium-emanation therapy* comparatively little has been published in the period under review. It is worth while directing attention to the work of Léri on *thorium therapy*. Successes are reported with different cases of spondylitis rhizomelica. Arthritis in the form of 'rhumatisme goutteux', and cases of thyro-ovarian origin were also influenced favourably. Subcutaneous or intramuscular injections of bromide of mesothorium and bromide of thorium X are given. Weissenbach and Françon also issued publications in this field. Vincent Coates writes on the rôle of radio-active waters in the treatment of arthritis.

**X-ray Treatment.**—In the opinion of the reviewer, the medical world still pays too little attention to X-ray treatment of different rheumatic affections (various kinds of arthritis, some cases of sciatica, and a few cases of rheumatism of the internal organs). It is with satisfaction, therefore, that he can refer to the favourable results obtained by Kahlmeter and Aekerlund (Stockholm) in a great number of cases of arthritis, in arthritis deformans of one big joint as well as in chronic polyarthritis and spondylitis deformans. During the discussions following the reading of their paper at the Scandinavian Congress it appeared that various other speakers also were very well satisfied with the results to be obtained by this means.

From Germany, too, there are some favourable communications, e.g., from Moses (Dessa) and from Fried, who gives a review of the number of cases treated, with indications as to the irradiation technique. From the Innsbrück University Clinic come favourable reports by Grauer on X-ray treatment of spondylarthritis deformans, special prominence being given to the disappearance or diminution of the often intolerable pains and to the improvement in the mobility of the spinal column. The investigator thinks that the Röntgen picture may change also, resulting in the disappearance of the cloudy zones round the rim exostoses. He ascribes the therapeutic effect in fact to the disappearance of the peri-radicular infiltrations.

Dausset and Lucie (Paris) are likewise well satisfied with the results obtained in l'Hôtel-Dieu with X-ray treatment in diseases (chronic arthritis) of the hip. S. Cochrane Shanks, of Charing Cross Hospital, draws attention to the significance of X rays, not only in diagnostics but also in the treatment of different cases of rheumatic and allied disorders.

**Electrotherapy.**—The great expectations in regard to the influence of electrotherapy on rheumatic diseases have not been entirely fulfilled. Undoubtedly there are much more active factors, which are far less cumbersome, both in the physico-therapeutical field and outside it. Nevertheless electrotherapy deserves our attention in different cases. In this connection the writer would refer to a communication by Pap Lajos (Budapest), who is active as director of the consulting bureau for rheumatic patients at the Budapest University and writes about "Iontophorese bei Myalgien". Further, Humphris (London)

gave an excellent outline of the indications for static electricity at the Liège Congress. Snow (New York City) also made a similar communication at the International Congress.

The energetic and competent advocate of electrotherapy in Austria, Kowarschik (Vienna), gives valuable general views about *Arsonval's method* in connection with the lawsuit against the well-known quack, Zeileis. In an interesting article on the electrical treatment of chronic rheumatism, Turrell (Oxford) recommends high intensities of current for at least thirty or forty minutes, to obtain maximum results.

It is also the opinion of the reviewer that many failures in electrotherapy are attributable to defective technique and to the opinion prevailing among a section of the medical profession that all this is only suggestive therapy after all.

**Anion Therapy.**—The method of Strassburger and Dessauer (Frankfurt) of artificially applying anion therapy in a certain way undoubtedly deserves full attention. The method (*unipolarly charged air*) is still too much in the experimental stage to refer to it at length here.

**Dietetic Treatment.**—Any serious communication on diet in arthritis and rheumatic diseases will always be welcome, because this neglected subject is of such great practical significance and our knowledge so extremely slight. As a matter of fact, many successful cases treated by quacks and laymen are based on the prescription of a dietary which is neglected by the medical man, or on a regimen so severe that the doctor consulted would not dare to prescribe it. In this connection the reviewer would once more draw attention to the important statement made by Determann (Wiesbaden) at the Congress at Amsterdam of the "Gesellschaft fuer Verdauungs- und Stoffwechselkrankheiten". Pemberton's article in *Die medizinische Welt*, and the address on the rôle of starvation in treatment by E. Spriggs (Ruthin Castle), also merit interest.

The American communications published in the *Journal of the Laboratory of Clinical Medicine* (St. Louis) by Fletcher, Snijder, and Traeger are deserving of especial medical attention. In the latter's article an attempt is made to justify the reasonableness of a basic diet for chronic arthritis on the ground of research work and observations. Indirectly the publications by G. Modrakowski (Warsaw) on alkali and acid treatment and by Ch. Finck (Vittel) on uremia and acidosis greatly contribute to dietary science.

**Salicylates.**—The comparison of ammonium salicylate with sodium salicylate is continued in some articles by Johnson and Hanzlik, as also the comparative research work of salicylate with cinchophen. The question of the extent of the action of salicylate therapy on the heart in rheumatic fever was further studied by Wyckoff, De Graff, and Salomon Parent (New York), the conclusion arrived at being that "disturbances of A-V conduction time during the course of rheumatic fever show wide and inconstant variations, and there is no proof that they are influenced by salicylate therapy." From the French side, too, documentary testimony was produced in the *Revue de Médecine* by Caussade and Tardieu of the benefit of salicylate in rheumatic fever. **Phenyl-cinchoninic Acid** (Cinephen) is warmly recommended by Evans and Spence for *chronic gout*. J. M. Bouwers (Seattle), D. Neighbors (Texas), and E. Harbenson (Woodland) make a number of communications on the treatment of arthritis with derivatives of **Benzoic Acid**.

Some new points of view are opened up by Jacques Forestier in his article on the treatment of chronic polyarthritis by **Gold Salts** in the *Acta Rheumatologica*. W. Fehlow (Berlin) treats of intramuscular therapy with **Solganal**, a gold preparation of Schering's. In both cases the provisional conclusions are not unfavourable. In any case the treatment deserves interest and further control. Weissenbach and Françon gave a most readable review of the uses of

**Arsenic, Phosphorus, and Sulphur** in the treatment of chronic rheumatism, as did Dautrebande of the **Iodine** treatment of hyperthyroid rheumatism. H. Mueller (Frankfurt) gives a criticism of the influence said to be exercised on sciatica by **Pyrazolonum Dimethylaminophenyldimethylicum**. This name in itself is a recommendation of the paragraph.

In the Consulting Bureau for Rheumatic Diseases of the Dutch Society on Rheumatism an investigation was made by Tempelaar and van Breemen on the influence of **Ovarnon** in climacteric arthritis. Care was taken to exclude suggestive influences from the side of the doctor and of the patient by following a special method. In a small percentage of cases a distinct improvement was noticeable after 2 tablets had been taken three times daily for some three to four months.

**Anodynes**.—According to the writer of this review **Aspirin** is still one of the best remedies for rheumatic pains in general, if it agrees with the patient. Yet, in view of the fact that pain is such a pronounced symptom in all cases of rheumatism, some new remedies should be mentioned—e.g., **Aconitum Napellus** (H. van Kress), **Opolen** (O. Adler, Karlsbad), **Tachalgan** (W. Hartogh). The articles by Ryneerson and Hench (Mayo Clinic) on the treatment of chronic rheumatic diseases with special reference to patent remedies and cults, and a résumé of results observed in the treatment of arthritis and rheumatoid conditions, practical therapeutics, are worth mentioning.

Not many new aspects in the domain of medicinal baths have come to light; some articles on the use of **Transkutan Baths** deserve interest (e.g., in *La Revue médicale*, April, 1931).

**Vaccination, Vaccine Therapy, Serum Therapy**.—Numerous articles have appeared in the field of the serological diagnosis in arthritis and vaccine therapy. The limited space at our disposal here again enforces brevity. L. K. Wolff (of the Hygiene Laboratory of the Utrecht University) gave a very good outline of non-specific immunization, making observations on therapy besides giving a biological basis. To keep to Holland, we may add that Spronck and Hamburger have continued their researches into the question of the *Bacillus rheumaticus*, which they think they can breed from the mucous membrane of the throat and of which they are preparing a vaccine.

An interesting comparative study of the respective value of salicylates and vaccines in the treatment of Bouillaud's disease (*Acta Rheumatol.*, No. 8) was made by Schnabel (Colmar), in which he expounded the pros and cons of the two methods. From the Consulting Bureau for Rheumatism (Centre anti-rhumatismale) at Brussels came a publication by Le Fèvre de Arrie, from which it appears that, though physical treatment is considered most important in chronic rheumatic suffering, vaccination is not neglected. A. Cohen (Philadelphia), in his article on treatment of chronic arthritis with biological products of the *Streptococcus cardio-arthritis*, lays stress on the fact that overdosing is the great objection among many who apply vaccine therapy. He points out the symptoms which, in his opinion, are characteristic of this.

It is a well-known fact that in the therapy of chronic rheumatism opinions differ greatly in different countries as to the value of vaccination, and that some countries, England and America especially, frequently regard vaccine therapy as the only one or the principal one, whereas other countries ignore it. It is evident that this state of affairs is connected with conceptions of rheumatism varying both from the scientific and the diagnostic points of view, a widely different place being assigned to the conception 'focal infection'. It stands to reason that in the circumstances the significance of articles on vaccination will also differ greatly for different nationalities, so that the task of the reviewer is frequently a troublesome one.

W. H. Strieman (Oakland) thinks that in a number of cases of chronic rheumatic arthritis he has attained not inconsiderable results with 'focal vaccines'.

Special interest is merited by the article in the *Journal of Bone and Joint Surgery* by Burbank and Christensen (New York), who submit a most important report on specific vaccine treatment of one thousand cases of chronic arthritis, with results and clinical observations. The present writer cannot here go further into the important diagnostic remarks made by the writers, but would mention that auto-vaccines have been made, while further vaccines may be added. The dosage is very light and is given intramuscularly every week. According to the writers the results are very favourable, so much so that the reviewer must warn against over-optimism, but this line of research work and the method of treatment certainly merit attention. A number of articles treat of the pros and cons of Pondorff's method or Cutinvaccine Paul (Freund, Ferrières, etc.).

Another very important study appeared in the *American Journal of the Medical Sciences*, from the Rockefeller Institute for Medical Research, New York, by C. Hitchcock, C. McEwen, and Homer Swift, on antistreptococcus serum treatment of patients with rheumatic fever. This is an excellently documented article, and the reviewer cannot refrain from quoting the final sentence, which runs as follows: "Of this one can be certain: that antistreptococcus serum in no way replaces the long-established therapy of rheumatic fever, nor does it apparently add enough to warrant its universal adoption. In our experience the unpleasant reactions sometimes attendant upon its application have not been outbalanced by a reciprocal certainty of therapeutic benefit."

From the general viewpoint the articles by P. le Floch, E. E. Irons, and E. Giraud are also of value. Finally, there is the most important publication in the opinion of the reviewer, Warren Crowe's booklet, *The Treatment of Chronic Arthritis and Rheumatism*. Time will show if Warren Crowe's conceptions are correct, but his conscientious and important work is certainly deserving of the greatest attention. It should be read by every medical man interested in the combating of rheumatism.

**Non-specific Protein Therapy.**—The great interest shown a few years ago in the various forms of 'Reiztherapie' has now considerably diminished. In general it may be said that it has not answered the great expectations temporarily cherished. That its injudicious use in different countries has contributed to this is once more explained by one of the great supporters of Reiztherapy (Zimmer). The year 1930 consequently brought little, if any, news in this domain. Zunz (Brussels) gave a very good article on the subject, with an ample discussion especially of the morbid physiology.

**Orthopædics.**—A great number of good articles were published in this field—a happy phenomenon. It is not to be denied that arthritis is but a symptom of an underlying pathology and that the study of rheumatism is a subdivision of internal medicine, but the great knowledge which orthopaedists have proved to possess in the field of arthritis and their important therapeutic aids make them most valuable assistants.

Orthopaedic interest in connection with the arthritic problem is principally directed to two sides, viz. :—

1. To sympathetic ganglionectomy. Since Rowntree and Adson issued their publications in 1926, a great number of communications have appeared in this branch, both from the side of these writers and from other sides. To those who wish to find their bearings in this important therapeutic field, articles by the following writers can be recommended: R. Leriche and A. Jung, P. G. Flothow, A. Case, L. G. Rowntree and A. W. Adson, R. Glen Spurling, P. S. Hench, and M. S. Henderson.

2. The second point in which the interest taken expresses itself is the relation of orthopaedics to the rheumatic problem, which is now being vigorously tackled in different countries. In this respect the articles by Osgood (Boston), and Kahlmeter (Stockholm) are worthy of special mention. Lange (Muenchen) also gives a very readable survey. Further mention may be made of the articles by B. J. Chollett and L. Bershon, and A. H. Freiburg. At the Liège Congress Ory read a paper on "Chirurgie orthopédique et Affections rhumatoïdes". Of the other articles published by orthopaedists in connection with the rheumatic problem, and in which widely divergent subjects are broached, we might mention those by: A. Saxl, Paul Mathieu, K. Bragard, R. Leriche and A. Jung, E. W. Baum, W. Payr, H. von Staa, N. Allison, and G. K. Coonse, J. Hass, A. Lâwen, D. D. Ashley, J. T. O'Ferrall, H. Lyle, and F. A. Chandler.

**Psychotherapy.**—In certain countries, England, Holland, and Germany especially, the medical man is so accustomed to linking up climate, rheumatism, and the patient himself in a causal connection that undoubtedly the considerable influence of psychic factors (especially those causing mental depression) has been underestimated. Without a doubt there are striking instances—the reviewer has seen some himself—of the influence of psychic factors (depressing emotions) on the causation of rheumatism and also of the favourable influence of psychotherapy in its treatment. Here the articles by Alfred Joseph on "Rheumatoïde Erscheinungen und ihre seelische Beeinflussung" deserve attention.

**BIBLIOGRAPHY.**—Most of the writers referred to in the above review are indexed, with full references, in *Acta Rheumatologica* (487, Keizersgracht, Amsterdam), of which Dr. van Breemen is the editor. Following is a list of the principal books and pamphlets on rheumatism and allied subjects which appeared during 1930 and the first part of 1931.

F. J. Poynton and B. Schlesinger, *Recent Advances in the Study of Rheumatism*, 1931; Max Lange, *Die Muskelhärten (Myogelosen). Ihre Entstehung und Heilung*, 1931; Maxmillian Sternberg, *Rheumatismus, Gicht, Ischias*, 1930; M. P. Weil, "Ce qu'on appelle le Rhumatisme", Suppl. *La Médecine*, 1930, Dec., No. 18; Alvin F. Coburg, *The Factor of Infection in the Rheumatic State*, 1931; L. A. H. Vanhouteghem, *Bijdrage tot de Pathologie van den Bloedsomloop van de Huid en van het Bloed bij Chronisch Rheuma*, 1931; Paul Steffens, *Die Anionen-Behandlung ein Ersatz der radioaktiven Bäder und der Hochfrequenz-Behandlung, nebst Untersuchungen über Witterungswechsel und Radioaktivität*, 1931; H. Warren Crowe, *Handbook of the Vaccine Treatment of Chronic Rheumatic Diseases*, 1930; F. Klinge, "Das Gewebsbild des fieberhaften Rheumatismus", I-III, Mitteilung, *Firchow's Arch.*, 1930, cclxxix; M. P. Weil and Ch. O. Guillaumin, "La Calémie", *Rapp. Congr. Franc. de Méd.*, 1930; Hermann Steinitz, "Calcinosis circumscripta (Kalkgicht) und Calcinosis universalis", *Ergebn. innere Med. u. Kinderheilk.*, 1931, xxxix; Daniel Critzman, *La Goutte*, 1931; H. Dausset, L.-H. Dejust, A. Chenilleau, and L. Brace-Gillot, *Comment sont traités les Rhumatisants chroniques dans le Service Central de Physiothérapie de l'Hôtel-Dieu de Paris*, 1931; J. van Breemen, "Toepassing van infrarode stralen bij de behandeling van reumatische patienten", *Ned. Maandschr. v. Geneesk.*, 1930, No. 10; A. H. Douthwaite, *The Treatment of Chronic Arthritis*, 1930; B. Langdon Wyatt, *Chronic Arthritis and Rheumatoid Affections with Recovery Record*, 1930; Jacques S. dillot, *L'Arthritisme: ses Misères, ses Dangers, son Traitement*, 1931; E. Seifert, "Ueber die schmerzhafteste Schulterversteifung (Peri-arthritis humeroscapularis)", *Wuerzb. Abhandl.*, 1930, No. 8; Charles Fuselier, *Le Rhumatisme articulaire aigu tuberculeux*, 1930; P. Ravaut and R. Boulin, *Le Rhumatisme blennorrhagique*, 1930; L. Duvernay, *L'Arthrite chronique de la Hanche*, 1930; Holmuth Cramann, "Ueber die chronische Steifigkeit der Wirbelsäule", *Mittel. Grenzgeb. Med. u. Chir.*, 1930, xli; Henri Roger, "Les Sciatiques, Formes cliniques et Traitement des Sciatiques rhumatismales", *Rev. Neurol.*, 1930, June; M. Zur Verth, "Lumbago und Lumbago ossea unter besonderer Berücksichtigung der Unfallstellung", *Hefte zur Unfallheilk.*, 1930, No. 5; J. Reinhardt Natvig, *Untersuchungen ueber das Auftreten des Rheumatismus in Oslo*, 1920-29, 1930; *Rheumaprobleme*, 1930, ii; *Rheuma-Jahrbuch*, 1930; E. Hesketh Roberts, *Recent work on Colporrhaphy, Rheumatism and Coli Bacilluria*, 1930, 2nd ed.

**RICKETS.** (See PARATHYROID GLANDS.)



**RINGWORM.** (*See SKIN, FUNGUS AFFECTIONS OF.*)**RUBELLA.***J. D. Rolleston, M.D., F.R.C.P.*

**SYMPTOMS AND COMPLICATIONS.**—According to M. O. Belson,<sup>1</sup> 118 cases of rubella were reported in Charlestown, a section of Boston, during the first five months of 1930, as compared with only one case during the whole of 1929. The epidemic was remarkably mild. There was an almost complete absence of prodromal catarrhal symptoms. In 35 out of 36 cases seen by Belson, the eruption was the first symptom and was not accompanied by itching or followed by desquamation. The temperature was normal in 60 per cent, and in the rest was raised from 0.2° to 1.0° F. with one exception, in which it was 100°. There were no complications.

O. Potter<sup>2</sup> records three *severe cases*. The first was in a woman aged 40, in whom the attack was complicated by swelling of the knees, ankles, wrists, and finger-joints. The second was a girl of 5 who developed *encephalitis* (*see also* MEDICAL ANNUAL, 1931, p. 420), and the third was in a woman whose attack was complicated by *lobar pneumonia*. All made a complete recovery.

**REFERENCES.**—<sup>1</sup>*New Eng. Jour. Med.* 1930, cccii, 1076; <sup>2</sup>*Brit. Med. Jour.* 1930, ii, 1084.

**SACRO-ILIAC AND LUMBO-SACRAL ARTICULATIONS, DISEASES OF.***E. W. Hey Groves, M.S., F.R.C.S.**S. J. H. Griffiths, F.R.C.S.*

In the majority of the affections of the sacro-iliac and lumbo-sacral articulations conservative measures alone are indicated, but fusion operations, especially in tuberculous cases, have a definite place. Willis Campbell<sup>1</sup> gives an analysis of 63 cases which have been operated upon. The following table shows the indications for operation:—

Infection .. ..	35
Trauma .. ..	11
Congenital anomalies ..	3
Benign tumours .. ..	1
Tuberculosis .. ..	13
	<hr/>
	63

He sums up the results in these 63 cases as: Excellent 35, good 5, poor 9, died 5, unknown 9. As the result of these observations in affections of the lumbo-sacral and sacro-iliac articulations, Campbell has come to the following definite conclusions: (1) In all cases except those with tuberculous involvement, conservative measures should be employed before fusion operations are considered. (2) In tuberculous cases and those with persistent symptoms or definite abnormalities demonstrated by radiograms fusion operations are indicated. (3) All extraneous cases must be carefully excluded. (4) Fusion operations are indicated earlier in wage-earners. (5) Fusion of the lumbo-sacral articulation causes no practical disability, though

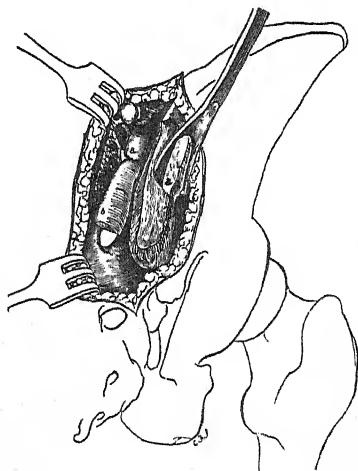


Fig. 100.—Placing of multiple chips into denuded gutter formed by posterior surface of sacrum and inner surface of dorsum of ilium; *a*, Small bone particles; *b*, Large bone fragment.

(Figs. 100, 101 by kind permission of 'Surgery, Gynecology, and Obstetrics'.)

there may be slight limitation of flexion of the spine. (6) Fusion of the sacro-iliac joint causes no disability.

The object of the fusion operation is to fix or splint by an internal osseous

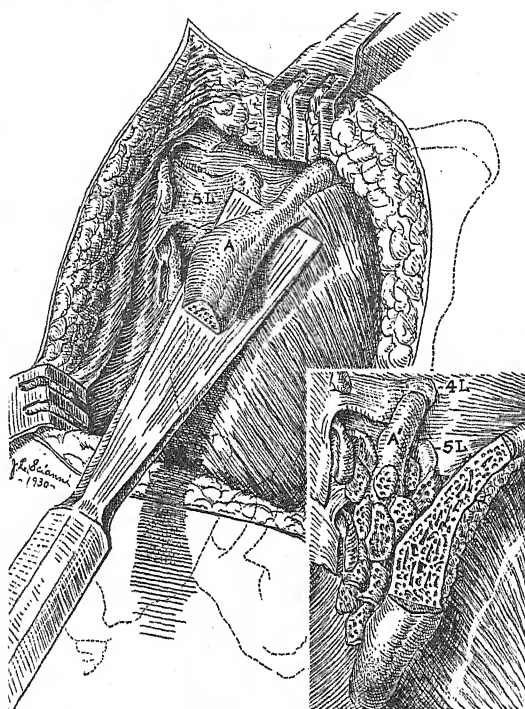


Fig. 101.—Removal of posterior portion of the crest of the ilium. Inset shows removed portion of ilium, *x*, lying on denuded surfaces of sacrum and transverse processes of fourth and fifth lumbar vertebrae. Multiple chips are placed about the portion of the ilium and into the denuded gutter.

bridge the affected area, which may be one, two, or all three articulations. To avoid the lighting up of a latent infection, especially when dealing with tuberculous cases, an extra-articular operation is advised. The incision passes along the iliac crest from the posterior third of the postero-inferior spinous process. The crest of the ilium is dissected free of the adjacent fibrous tissue from the posterior surface of the sacrum. The osseous bridge or splint is taken from the crest of the ilium. A gutter is made between the overhanging bone of the crest of the ilium and the adjacent posterior surface of the sacrum, and into this a graft is placed. If necessary, the gutter may be filled up with shavings "taken from the dorsum ili".

If it is desired to fuse the lumbo-sacral articulation at the same time, then the anterior aspect of the transverse process of the fifth lumbar vertebra is denuded and the osseous graft allowed to extend upwards to include this denuded surface. (Figs. 100, 101.)

REFERENCE.—<sup>1</sup>*Surg. Gynecol. and Obst.* 1930, Sept., 381.

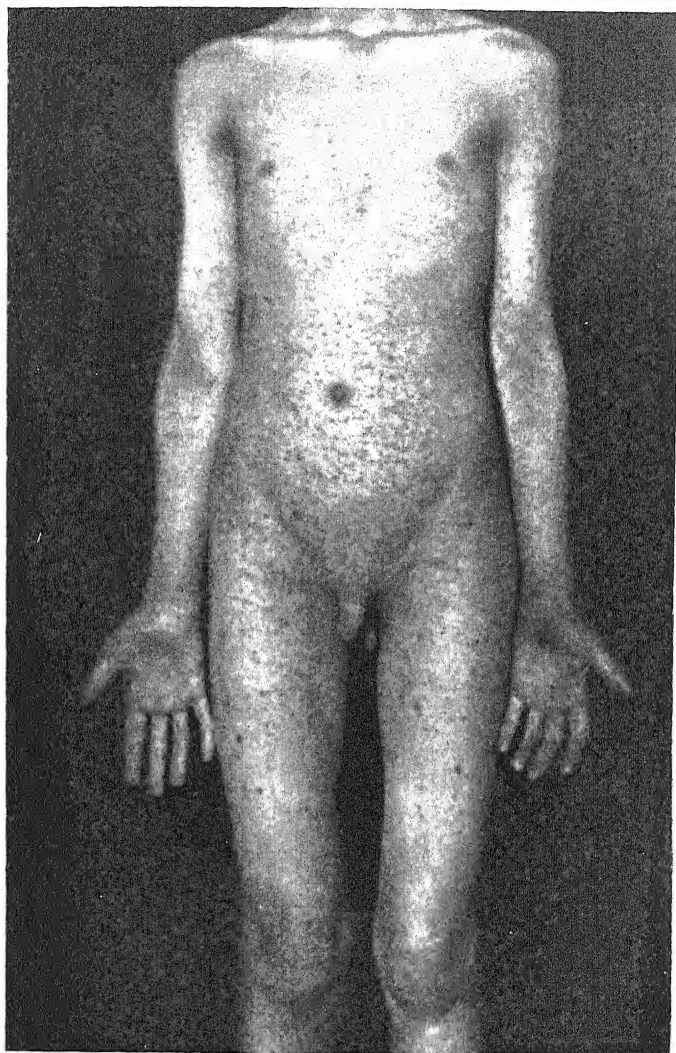
## SCABIES.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

Attention has again been called to this disease by a discussion at the Royal Society of Medicine<sup>1</sup> on its transmissibility from animals. It may not therefore be out of place to consider what is known about scabies, of human and of animal origin. The disease, as is well-known, is caused by the *Sarcoptes scabiei* var. *hominis*, a small acarus or mite, which attacks the human skin in a way to be described. The acarus responsible for the production of sarcoptic mange in animals is indistinguishable microscopically from the human acarus except by its size, being usually smaller than the human variety. There is, however, a distinct difference in behaviour when the human skin is attacked by animal acari from that which occurs in human scabies, this probably being due to the

*PLATE LVII*

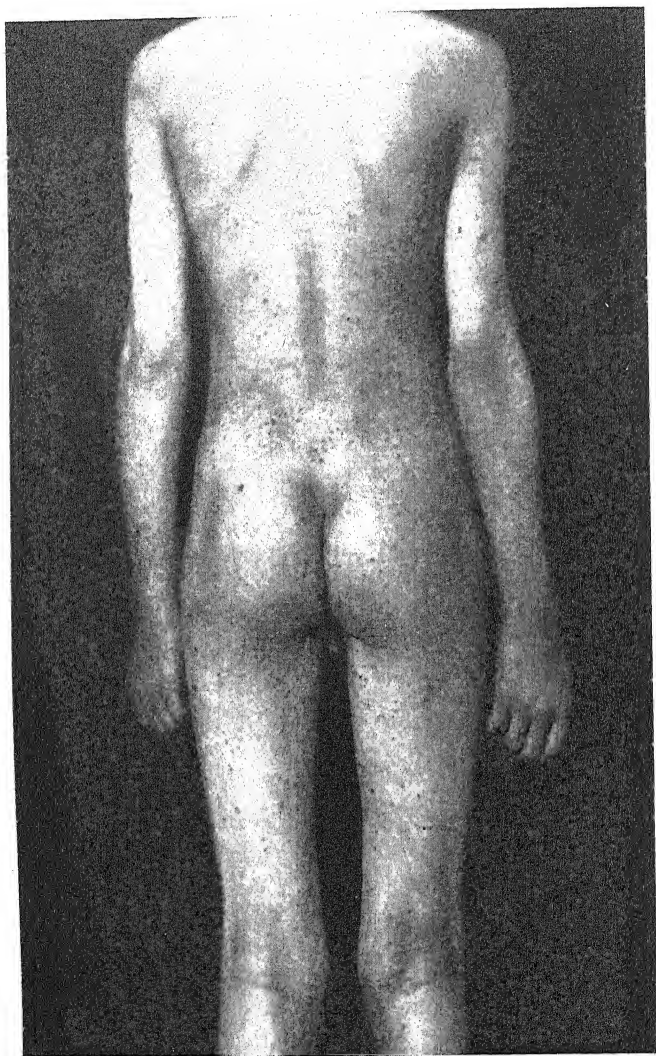
SCABIES



*Fig. A.*—Showing distribution of the eruption on the front of the body.

*PLATE LVIII*

SCABIES—*continued*



*Fig. B.*—Showing the distribution of the eruption on the back of the body :  
buttocks, thighs, and upper limbs.

fact that animal acari do not find the human skin a congenial soil for further development.

The human acarus produces two distinct types of lesion—'burrows', and a 'follicular eruption'. The burrows, which are produced by the female acari, tend to be found in certain definite sites, of which the genitals are probably the most frequent, and after that the sides of the gluteal cleft, the hands—particularly the sides and webs of the fingers, the ulnar border of the hands, and the palms—the front of the wrists, the tips of the elbows, the anterior axillary folds, the areolae of the nipples, the umbilicus, the insteps, and soles of the feet. The appearance of the burrow varies in different areas. On the hands and feet, where the horny layer is thick, no inflammatory reaction may take place, and the burrow may be visible as a straight or sinuous line on the normal skin, slightly splayed out at one end towards the point of entry, and showing the shiny white body of the female acarus, just visible with a hand lens, at the other. Vesicles, however, sometimes develop in association with these lesions on the hands and feet, and when seen are clearly beneath the burrow. These vesicles are liable to secondary infection and may become purulent, and from them impetigo lesions may develop. On areas where the horny layer is thin—on the genitals, anterior axillary folds, etc.—the burrowing acari tend to irritate the skin and an inflammatory reaction results, so that in these areas large, red papules are seen, sometimes with the burrow visible on the surface, but more often only the crust showing where the burrow has been scratched away. These papules are often linear or oval in shape, and their appearance and distribution are usually pathognomonic of the disease. These lesions are found on the penis, including the glans, and on the scrotum and sides of the gluteal cleft, and also on the labia majora and minora, and are very characteristic.

The other type of lesion found in scabies, and occurring in association with the burrows, is a discrete eruption of small follicular papules having the following distribution in a well-marked case (*Plates LVII, LVIII*): on the back and front of the arms and forearms; on the front of the shoulders; on the front of the trunk and thighs from the nipples to the knees, running outwards over the hips and loins; on the lower part of the buttocks and the back of the thighs; and, if the feet are affected, around the ankles and lower third of the legs. The lesions, if seen in the early stage, have the appearance of a small urticarial wheal; later a vesicle may develop; later still they become covered with blood-stained crusts from scratching, or may become impetiginized.

It is clear that the 'burrows' are produced by the impregnated female acarus and that in them she lays her eggs. According to J. W. Munro,<sup>2</sup> whose investigations on this subject during the Great War have not received the attention they deserve, the eggs hatch out into larvæ after about three days, and thereafter both sexes pass through a nymph stage before reaching maturity. In the case of the female a second nymph stage has been recognized, and it is during this stage that she becomes impregnated. The impregnated female may, if not disturbed, live for four to five weeks, and in this time lay as many as forty to fifty eggs.

The cause of the 'follicular eruption' is less clear. In the past it was thought to be a toxic rash, due to absorption of toxins injected by the acarus, or simply a scratch eruption due to the spread of itching from the burrows. It was also thought by some that the male acarus, which was only very occasionally found, might be responsible. Munro found, however, that the larval acari, when they escaped from the burrows, tended to get into neighbouring hair follicles, where their further development into adult acari took place. It is probable that here they set up irritation in the follicles. The

adult male does not get into follicles nor does it set up any itching. This observation of Munro's appears to offer a reasonable explanation for the follicular eruption, especially its curious distribution, which, it will be noticed, takes the form of wide circles around the areas in which the burrows are found.

The lesions of animal scabies differ from those of human scabies in two respects. First, burrows do not occur (an occasional one has been observed, but they are very rare: Whitfield with a very large experience has only found an acarus on three occasions). It would appear that the animal acarus does not find the human skin a suitable medium in which to form her nest. Secondly, the follicular eruption, though present in the same form as in the human type, does not take on the same distribution. The distribution is often asymmetrical, and varies much in different cases; it is governed largely by external factors. Dog scabies is the most frequent variety seen, and it occurs usually in people who nurse pet dogs, especially in cases where the animal sleeps on, or in, the same bed. Human scabies is transmitted more easily when the body is warm, as acari are inactive when the body cools down; hence most cases of scabies are transmitted in bed. The same applies to animal scabies, and it is not infrequent to find that the eruption is limited to the area of the skin with which the animal comes in contact, such as one side of the chest and arm, when the animal is habitually carried.

**TREATMENT.**—The treatment of *human scabies* is based upon our knowledge of the behaviour of the acarus. It consists of three processes: (1) Opening of the burrows by scrubbing in a bath; (2) The application of a parasiticide; (3) Sterilization of infected clothing. It is only necessary to do the scrubbing once at the commencement of the treatment: the patient should soak for ten to fifteen minutes in hot water and then lather all over with soap—soft soap is preferred by some—and finally scrub the hands and feet with a stiff nail-brush and rub the genitals, axillæ, etc., with a rough flannel. After drying, the parasiticide is applied. Various preparations are available, but **Sulphur** is mostly employed. If the ordinary B.P. sulphur ointment is applied, it should be used daily for three days without another bath; but stronger preparations, such as the Danish preparation '**Kathiolan**', which is said to be a mixture of the higher sulphides of potassium, is claimed to cure by one application only. This method appears to cure a large percentage of cases, but the three days' application a higher one. Whichever method is used, on the fourth day—or at the end of twenty-four hours, as the case may be—another bath is given to remove the sulphur preparation, clothes are changed, and all the underclothing and sheets are disinfected. Disinfection in scabies is simpler than in pediculosis, as the acarus and its eggs are very easily killed. Washing underclothes in boiling water suffices, while the outer clothing may be hung up in a well-ventilated and dry place, especially in the sun for a few hours, and the acari will die off. Ironing the clothes is also of value.

After a course of treatment outlined above, there is a tendency to sulphur irritation, or even sulphur dermatitis. This usually shows itself as an itching of the skin, chiefly on the trunk and the flexures of the limbs, which begins four days to a week after the first sulphur application. Later a red, dry, eczematous eruption may develop on the areas named. Too vigorous or frequent baths, too vigorous rubbing, and too strong ointment all tend to produce this. The patient should be warned of this fact and told not to use more sulphur under any conditions. Some calamine liniment, with 1 per cent ac. carbol. or 1 to 2 per cent liquor picis carbonis added, applied once or twice daily will check the irritation.

Methods of treatment by sulphur baths, painting with liquor calcis sulphurata, or the use of the sulphur vapour cabinet have not proved so effective as the

ointment treatment, but other drugs may be substituted for sulphur; of these 12 per cent **Balsam of Peru**, and 10 per cent  $\beta$ -**Naphthol** are frequently used, while a German preparation '**Mitigal**', dimethyl-diphenylene-disulphide, is less messy than sulphur ointment and is claimed to act without a preliminary bath: it is rubbed in daily for three days.

D. W. Montgomery and G. D. Culver<sup>3</sup> recommend a 5 per cent **Creolin Ointment**, while L. de Mello<sup>4</sup> applies **Liq. Cresolis Co.** to the whole body (excluding the neck and face) on two or three occasions.

It must be remembered that all contacts should be examined and if necessary treated in order to prevent re-infection.

In treating *animal scabies*, the matter is more simple: there are no burrows to be opened up, and the animal acari will not live on the human body if the infected animal is removed. A cure therefore depends on the ability of the doctor to discover the cause. A mild sulphur preparation applied for a few days will relieve the itching and is all the treatment that is necessary.

REFERENCES.—<sup>1</sup>*Proc. Roy. Soc. Med.* 1931, June, 1151; <sup>2</sup>*Jour. R.A.M.C.* 1919, xxxiii, 1; <sup>3</sup>*Med. Jour. and Record*, 1930, Oct. 1, 334; <sup>4</sup>*Arch. of Dermatol. and Syph.* 1931, May, 863.

**SCALDS.** (See BURNS AND SCALDS.)

### SCARLET FEVER.

J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—According to the Monthly Epidemiological Report of the Health Section of the League of Nations,<sup>1</sup> 744,731 cases of scarlet fever were reported in Europe in 1929 as compared with 695,065 in 1928 and 667,222 in 1927. The increase occurred in sixteen out of twenty-nine countries, being most marked in Roumania, where it reached 106 per cent, in England, where it was 42 per cent, and in Czechoslovakia, 40 per cent. The differences in case-mortality in the various countries have been very great, varying from 0.4 per cent in Austria to 21.5 in Chosen.

A. A. Weech<sup>2</sup> illustrates the severity of scarlet fever in China by allusion to the epidemic in 1921 at Yunnan-fu, the capital of Yunnan Province in South-West China, where one-fourth (50,000) of the entire population perished (see MEDICAL ANNUAL, 1925, p. 383), as well as by his own experience at Peiping Union Medical College, where 13 out of 51 cases admitted died, all the fatal cases being in children under 14 years of age.

O. Fischer<sup>3</sup> states that scarlet fever is practically unknown in the Tropics, especially in tropical Africa, where only isolated cases have been seen among recently arrived Europeans and are never followed by an epidemic among the natives. Dick tests, however, carried out by Fischer on 376 natives were positive in 7 (1.8 per cent). This incidence, though much lower than in Europeans, among whom about a third are positive, is sufficient to show that the black race is not absolutely immune to scarlet fever.

SYMPTOMS AND COMPLICATIONS.—A. Lichtenstein<sup>4</sup> states that there has recently been a remarkable increase in the frequency of *relapses* in scarlet fever at the Stockholm Epidemic Hospital, especially since 1925. Whereas formerly the incidence was from 0.5 to 0.6 per cent, in 1926, 1927, 1928, and 1929 it was 7.2, 7.4, 7.5, and 7.1 per cent respectively. The relapses were commonest between the ages of 5 and 10 years, and in the third and fourth weeks of the disease. In most cases the symptoms were mild, but 56 out of 213 cases were sufficiently severe to require serum treatment, and 4 out of 377 cases or 1.1 per cent were fatal. Relapses were less frequent in cases treated by scarlet fever antitoxin or convalescent serum than in cases not so treated.

W. Look<sup>5</sup> found that the *Schultz-Charlton reaction* was positive in 13 out of 14 cases of relapse. In 5 cases it was positive both in the primary attack and

in the relapse, in 1 case the reaction was doubtful, and in the remainder the rash of the primary attack had disappeared or the reaction had not been performed. The Schultz-Charlton reaction therefore in the relapse does not differ from that in the primary attack.

The usual time for *nephritis* to occur in scarlet fever is towards the end of the third week, and usually complete recovery takes place within six weeks. E. A. Underwood<sup>6</sup> records a case in a girl aged 16 which was remarkable in that *nephritis* developed on the second day of disease, if not earlier, and lasted for nearly six months. The urine was normal on discharge from hospital, but four years later the patient was reported to have chronic *nephritis*.

In view of the rarity of *endocarditis* in scarlet fever the case recorded by H. W. O. Frew<sup>7</sup> is of interest. The patient was a girl aged 8 years who developed severe rheumatism on the sixth day of a moderate attack of scarlet fever and in the third week evidence of cardiac involvement, which gradually became more marked. Death took place on the 268th day of illness, and the autopsy showed enlargement of the heart, thickening of the tricuspid, aortic, and mitral valves, and rupture of the chordæ tendineæ of the mitral valve. There was no evidence of recent formation of vegetations on the mitral valve.

C. R. Box and R. Massingham<sup>8</sup> record a case of scarlet fever in a boy aged 10 complicated by *purpura hemorrhagica*. Petechiae appeared on the abdomen on the tenth day, and on the following day spread over the body including the buccal mucosa. On the twelfth day epistaxis was profuse and the urine bloody. Later hæmatemesis, mælena, and abdominal colic ensued. **Liver Extract** was administered freely and within twelve hours there was an obvious improvement in the hæmorrhagic symptoms, and recovery took place. The early blood-counts showed a heavy polymorphonuclear leucocytosis, thrombocytopenia, and absence of eosinophils. Under treatment the platelets showed an early and rapid increase, the eosinophils reappeared, and the polymorphonuclears gradually diminished in number.

D. S. Sutherland<sup>9</sup> records two cases of *gangrene* associated with scarlet fever. The first case of this rare condition was in a boy, age 4½ years, who on the eighteenth day of a mild attack developed gangrene of the left leg. Amputation was performed in the sixth week and recovery took place. No evidence of thrombosis or embolism was found in the amputated leg. The second case occurred in a boy, age 4 years, suffering from post-scarlatinal otitis and *nephritis*, who developed *purpura fulminans* on the thirty-sixth day of disease and died on the forty-second. There was no autopsy.

J. B. Ellison<sup>10</sup> reports two cases of *thrombophlebitis migrans* in scarlet fever in boys aged 6 and 10½ years respectively. The complication, which occurred in both at a late stage of scarlet fever, presented the characteristic features described by Moorhead and Abrahamson, viz.: (1) Lesions disseminated in time and space, small lengths of superficial vessels being first attacked; (2) Phlebitis of the lungs and abdominal viscera; and (3) A favourable prognosis in spite of a prolonged course. Both patients made a complete recovery within five weeks of the onset.

PROPHYLAXIS.—C. Völckers and A. Röbbelen<sup>11</sup> report an outbreak in a children's home which was rapidly brought to an end by passive immunization of the unaffected children with 10 c.c. of scarlet fever **Antitoxin**, whereby absolutely certain immunity was conferred for at least two and a half weeks; 64 per cent of the children who had hitherto been Dick-positive were made negative by three injections of **Gabritchewsky's Vaccine**. Active immunization, however, was not certain by this method within fourteen days, and in some instances another dose of antitoxin had to be given.

O. Bauer and J. Minkiewitch<sup>12</sup> emphasize the importance of frequent baths



and the installation of fresh-air stations, or the formation of small wards and isolation rooms, as being the only means whereby a considerable proportion of scarlet fever patients can get rid of infection. It is absolutely necessary, therefore, to avoid overcrowding and mixing convalescents with acute cases.

**TREATMENT.**—In continuation of his previous observations (*see* MEDICAL ANNUAL, 1931, p. 424), E. Gabriel<sup>13</sup> contributes a paper based on 401 cases of scarlet fever treated with different kinds of **Antitoxin** and an equal number without. In no case treated by antitoxin did the temperature fall by crisis, so that no convincing example of the good effect of the remedy was ever seen; but complications seemed to be less frequent in cases treated with antitoxin. Serum sickness was noted in 25 per cent. Gabriel therefore concludes that scarlet fever antitoxin should be reserved for severe cases and that mild cases should not be given any, so as to spare them the discomfort of serum sickness.

J. Bakov,<sup>14</sup> like other Roumanian observers (*see* MEDICAL ANNUAL, 1931, p. 424), emphasizes the value of the therapeutic use of **Convalescent Serum**, which he regards as far superior to antitoxin in the treatment of malignant scarlet fever.

A. H. G. Burton and A. R. Balmain<sup>15</sup> claim that the tendency to relapses can be prevented by Dick-testing the convalescents and separating positive reactors from the others, removing clean convalescent patients to a convalescent ward, while patients with nasal, aural, or purulent discharges should be treated by the barrier or bed-isolation method, and lastly by keeping patients in the open air as far as possible.

**REFERENCES.**—<sup>1</sup>*Monthly Epidem. Report Health Sect. League of Nat.* 1930, 365; <sup>2</sup>*New Eng. Jour. Med.* 1931, cci, 968; <sup>3</sup>*Munch. med. Woch.* 1930, 1749; <sup>4</sup>*Acta Pædiatrica*, 1931, 379; <sup>5</sup>*Arch. f. Kinderheilk.* 1931, xciii, 65; <sup>6</sup>*Brit. Jour. Child. Dis.* 1931, 114; <sup>7</sup>*Glasgow Med. Jour.* 1931, xxxiv, 195; <sup>8</sup>*Lancet*, 1931, i, 295; <sup>9</sup>*Brit. Jour. Child. Dis.* 1930, 102; <sup>10</sup>*Ibid.* 1931, 207; <sup>11</sup>*Munch. med. Woch.* 1930, 1181; <sup>12</sup>*Deut. med. Woch.* 1930, 2123; <sup>13</sup>*Jahrb. f. Kinderheilk.* 1931, cxxxi, 148; <sup>14</sup>*Arch. de Méd. des Enf.* 1930, 327; <sup>15</sup>*Med. Officer*, 1931, xiv, 61.

## SCHISTOSOMIASIS.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

The action of chemicals in destroying the cercarial stage of human schistosomes in water has been further investigated by E. Griffiths-Jones, H. Atkinson, and A. Hassan in Egypt.<sup>1</sup> They confirm the lethal action of one in a million available **Chlorine** in three hours, but found **Chloramine** less effective if prepared by the 'United Water Softeners' method, but by the 'water-cart method' it was effective in one hour in filtered water in a dilution of one in a million, so can be used safely against bilharziasis. If bleaching-powder is used, the water should be stored for four hours with one in one million parts of available chlorine, or for one hour with three parts per million.

Some pathological conditions in schistosomiasis are recorded by A. R. Mohammed,<sup>2</sup> who has met with tumours containing the ova subperitoneally, in the great omentum, the seminal vesicles and vasa deferentia, and in a fibromyoma of the uterus. F. G. Cawston<sup>3</sup> points out the necessity of examining the urine for schistosome ova in appendicitis cases in the endemic areas, and, if found, the tartar-emetic treatment should be carried out before resorting to surgical interference. R. Girges<sup>4</sup> has published a general description of the pathology of schistosomiasis hæmatobium on the usual lines. M. F. Sorour<sup>5</sup> describes thickening of the endothelium lining of blood-vessels resembling arteriosclerosis produced by bilharzial worms.

**TREATMENT.**—J. B. Christopherson<sup>6</sup> deals with bilharzial disease in children, and advocates doses of 0.002 grm. per kilo., equal to about 2 grm. for an average man of 10 stone. F. G. Cawston<sup>7</sup> deals with the use of **Antimony Preparations** other than tartar emetic, and reports that **Fouadin**, recommended

by Khalil, frequently results in severe acute hepatitis or even hepatic cirrhosis with severe toxic effects, so that tartar emetic is preferable. R. M. Gordon and E. P. Hicks<sup>8</sup> report on trials of **Fouadin** and **Auremetine**. In six cases treated with the former, live ova ceased to be passed by the twenty-fourth day; 5 of the 6 patients lost 1 to 3 lb. in weight, and in one the treatment had to be stopped after vomiting had lasted for four days. In one case treated by auremetine, live ova also disappeared from the urine. W. L. Gopsil<sup>9</sup> found 80 per cent of the natives in riverine portions of Nyassaland infected with *S. haematobium*. He records good results in fifty cases treated by intramuscular injections of **Fouadin**, in doses of from 1 c.c. gradually increased to 4 c.c., on alternate days, and in children from  $\frac{1}{2}$  to  $2\frac{1}{2}$  c.c., and he found the reactions after the first dose to be less than after tartar emetic intravenously. After four injections the eggs in the urine were dead, and in *S. mansoni* cases the diarrhoea had stopped. Ten cases treated with **Emetine** injections also did well, but improvement in the general health was slower. After four months none of the fouadin cases had relapsed.

REFERENCES.—<sup>1</sup>*Ann. Trop. Med. and Parasitol.* 1930, Dec. 18, 503; <sup>2</sup>*Ibid.* 563; <sup>3</sup>*Jour. Trop. Med. and Hyg.* 1931, Feb. 16, 55; <sup>4</sup>*Ibid.* 1931, March 2, 65; <sup>5</sup>*Proc. Roy. Soc. Med.* 1930, July, 1369; <sup>6</sup>*Ibid.* 1930, Oct., 1733; <sup>7</sup>*Jour. Trop. Med. and Hyg.* 1930, Nov. 1, 317; <sup>8</sup>*Ann. Trop. Med. and Parasitol.* 1930, Oct. 22, 443; <sup>9</sup>*Jour. Med. Assoc. S. Africa*, 1931, April 11, 222.

## SCHIZOPHRENIA. (See MENTAL DISEASES.)

### SCIATICA.

Geoffrey Jefferson, M.S., F.R.C.S.

TREATMENT.—During the past years various methods have been considerably employed in the treatment of sciatica, notably **Caudal Epidural Injections of Saline or of Novocain**. The older (Schlösser) injection treatment by alcohol direct into the sciatic nerve behind the great trochanter has been abandoned because of the paralysis of the sciatic nerve which often persisted longer than had been anticipated. Further, injections at this level have been misplaced and have entered the hip-joint. It is safer to inject the nerve higher up, at its exit from the sacro-sciatic notch. The caudal or sacral route is easier than the direct puncture of the sciatic nerve. The object is to fill the sacral canal with fluid and so strip the roots of the sacral plexus. Forty c.c. of fluid 0.5 per cent novocain will generally anesthetize S. 2, 3, and 4, giving rise to the classical saddle area of anesthesia, with a long strip going down the back of the thigh and calf in addition. Injections of larger quantities rise still higher up the dura and do no harm, but 30 to 40 c.c. is the usual dose. The immediate result of the injection should be relief of pain, but after a variable number of hours it returns. In three days the injection is repeated, and so on, the intensity of the sciatic pain gradually diminishing in all but the most obstinate cases. Occasionally one or two injections suffice, others require six to ten. It will be understood that preliminary studies will have been made to discover and set in order any local sepsis which may be present, whilst a rectal examination will have excluded any pelvic growth. It is not sufficient to inquire for symptoms of pelvic disease; an examination must be made. [This was strikingly brought home to the writer in the case of a man 53 years of age with pain in the back and severe left-sided sciatica of recent onset. A completely fixed carcinoma of the rectum was discovered on palpation. Both the patient and his wife insisted that he had had no rectal trouble whatever, and even after the discovery of the growth they remained unshaken on this point.—G. J.]

Injections, whether into the sacral canal or into the sciatic nerve itself, may not suffice to subdue the severest sciaticas. There is, therefore, a tendency

to revert to **Alcoholic Injections**. G. Labat,<sup>1</sup> in an interesting discussion on novocain-block, admits that he has had to abandon adding alcohol to the novocain solution used for caudal block because of trouble with the sphincters. He is now employing injection of the first sacral nerve by the trans-sacral route. The total quantity injected is not more than 5.0 c.c. of 95 per cent alcohol, but this is diluted down with novocain to about 33 per cent. Motor function is abolished at first but should return the next day.

*Technique of the Injection.*—The patient lies flat on his face with a pillow under the hips, and an intradermal wheal is raised 1.0 cm. medial to and below the posterior superior iliac spine. This marks the second sacral foramen, and an injection may be made here if desired. The first sacral foramen is one inch higher, and as it is very deeply situated a 4-in. needle is required. Novocain solution is injected as the needle traverses until the back of the sacrum is reached, and if the first posterior sacral foramen is not at once entered it is best to wait a little while till the solution has had time to dull the pain which a search about the back of the sacrum will necessarily entail. After the foramen has been located the needle is passed in for a distance of 2.0 cm. and the injection of novocain-alcohol is made. As much as 15 c.c. of solution may be injected (i.e., 5 c.c. of 95 per cent alcohol diluted with 10 c.c. of 1 per cent novocain), but a less amount might be employed until the operator has become more familiar with a technique which can always be repeated.

E. W. Baum<sup>2</sup> recommends **Section of the Small Sciatic and Internal Cutaneous Nerves** behind the knee, and claims permanent cures in cases which have resisted all other forms of treatment. P. D. Woodbridge,<sup>3</sup> of Boston, has contributed an interesting résumé of the whole subject of treatment of pain by injection, with a comprehensive bibliography, which is worth studying.

REFERENCES.—<sup>1</sup>*Amer. Jour. Surg.* 1930, ix, 275; <sup>2</sup>*Deut. Zeits. f. Chir.* 1930, Sept., 312; <sup>3</sup>*Amer. Jour. Surg.* 1930, Aug., 278.

### **SCLEROSIS, DISSEMINATED.** *Macdonald Critchley, M.D., F.R.C.P.*

Numerous contributions have appeared within the last few years dealing with disseminated sclerosis. Among the more valuable reviews of the problem in all its aspects may be mentioned the survey of Russell Brain<sup>1</sup> and the monograph published by the American Neurological Research Committee.<sup>2</sup> Most of the recent researches have dealt with the aspects of etiology and pathogenesis; a few have considered the semiological details; no serious contribution has been made, however, to the therapeutic aspect.

#### **CLINICAL.**—

*Retrolubular Neuritis.*—C. P. Symonds<sup>3</sup> has dealt with retrolubular optic neuritis as a common symptom of disseminated sclerosis. When no other cause can be discovered, the diagnosis of disseminated sclerosis must be considered as probable in cases of acute retrolubular neuritis, and it must be remembered that subsequent neurological symptoms may not appear for many years. Of a series of 139 cases, Symonds obtained a history of retrolubular neuritis in 39 (28 per cent). It appeared as the *initial* symptom in 20 cases, and appeared together with other signs at the onset in another six. The interval between this initial symptom and the development of the second symptom was under two years in 10, between two and five years in 5, and over five years in another 5 patients. Symonds concludes that in a case of retrolubular neuritis of obscure origin, disseminated sclerosis remains a possible cause, even if no further signs of this disease have developed after a period of ten or fifteen years.

*Cause of Death.*—M. Zellmann<sup>4</sup> has recorded the fatal diseases to which a series of fifty patients with disseminated sclerosis have succumbed. Pneumonia proved the commonest cause of death, occurring in 58 per cent. In 36 per

cent some form of sepsis proved fatal, in the form of gangrenous decubitus, cystopyelitis, or renal abscess. Stenocardia came third on the list, being the responsible agent in 6 per cent. In Zellmann's series the majority of male patients died from pneumonia, most females dying from sepsis. Pneumonia proved fatal in the fourth, fifth, and sixth decades; sepsis in the third and fourth.

*Relationship with Other Diseases.*—Recent researches in acute infective disorders of the nervous system have indicated de-myelinization as the most characteristic histological feature; the question therefore arises of a possible common relationship between these disorders and disseminated sclerosis. Disorders such as neuro-optical myelitis (maladie de Devic), acute disseminated encephalo-myelitis, Schilder's disease, post-vaccinal encephalitis, and post-measles encephalitis fall into the group of demyelinating disease, and certain points of resemblance are demonstrable one with the other and also with disseminated sclerosis. A common pathogeny has been suggested, the resulting clinical picture differing according to variable internal or external factors. Russell Brain's summing-up of the situation may be quoted in full: "Disseminated sclerosis . . . biologically seems to merge into more acute disorders, such as neuromyelitis optica and some forms of acute disseminated encephalitis. Its relationship with post-vaccinal encephalitis, measles encephalitis, encephalitis periaxialis diffusa, and diffuse sclerosis is more questionable. Clinical and pathological distinctions cannot be accepted as necessarily incompatible with etiological identity . . . variations in dosage and virulence of the infective agent and in the immunity of the patient may possibly account for the wide range of reactions which we regard clinically as different diseases. Such hypotheses are not of merely academic interest, but of great practical importance. To accept the evidence that neuro-optical myelitis and disseminated sclerosis are probably due to the same pathogenic agent is to admit that recovery from this infection may occur. Does recovery in the former disorder depend upon a dosage of the virus which, if not immediately fatal, is sufficiently large to confer a permanent immunity? What factors are responsible for the great variability of the course of disseminated sclerosis? Does recovery from this condition ever occur? If a remission may last for 24 years, why not for 54? Does the remarkable degree of recovery possible in neuromyelitis optica and post-vaccinal encephalitis indicate that the processes which end in demyelination are at certain stages reversible? Is such a reversibility the explanation of the high degree of recovery from the effects of a single lesion in disseminated sclerosis? These possibilities suggest the hope that the cardinal feature of disseminated sclerosis, its relapsing tendency, may, when its cause is fully understood, provide a clue to the problem of immunity and so lead to the cure of the disease."

*ETIOLOGY.*—From time to time the suggestion has been made that disseminated sclerosis has a peculiar selective geographical distribution; that dwellers in rural districts are more prone, and that the disease is associated with such occupations as farming, dairy-work, carpentry, and forestry. A recent study of disseminated sclerosis has been made by Foster Coates<sup>5</sup> based upon one hundred cases seen at the Royal Victoria Hospital, Belfast. Two-thirds of the patients were town workers and one-third country workers; 10 per cent were farmers. The incidence of farmers among the hospital population as a whole amounted to only 3 per cent, county dwellers comprising 10 per cent. Coates concluded from these findings that disseminated sclerosis is more common among those living in country districts, but his statistics did not support the idea that the disease is more common among wood-workers.

R. S. Allison,<sup>6, 7</sup> in a valuable monograph, has recorded the results of a field

research into the etiology of this disease. He selected the province of North Wales as a well-defined area offering much variety in geographical and economic conditions. Through the courteous co-operation of the practitioners, Allison was able to investigate every case of disseminated sclerosis within this area, and to inquire deeply into the occupations and conditions of life, as well as into such factors as age, sex, injury, exposure, pregnancy, and heredity: 65 cases emerged and these were contrasted with a control series of 61 patients. The area held a population of 492,049; the incidence of disseminated sclerosis therefore amounted to 1 per 8600 inhabitants. These were scattered over the lines of densest population, though Anglesey appeared to contain rather more than its share of sufferers. Dark-complexioned types predominated (a local feature), and thin and tall persons were met with more frequently than short stout individuals. The distribution between urban and rural districts was about half and half, a proportion approximating to that of the general population. Domestic and agricultural workers predominated, but to about the same extent in both disseminated sclerosis and control cases; the proportion in each was about the same as that found in the general population. Mode of life and habits were noted in the hope that some common circumstance might be detected. No instance was found of two or more cases having lived in the same house, street, or district. The only recurring feature was an unsatisfactory water-supply, in many cases derived from a well liable to pollution. Such results were, therefore, mainly negative. Almost all the chief occupations were represented, but the farming classes did not appear to be more likely to develop disseminated sclerosis than other diseases of the nervous system. There was no frequency among wood-workers. Evidence was lacking to support the view that the rural incidence was greater than the urban. It is possible that had these cases been seen at a city hospital they would, coming from North Wales, have been placed in the country class, whereas in reality about half of them were living in small towns.

Research of this type is likely to prove of considerable help in unravelling the etiology of disseminated sclerosis, and it is to be hoped that other workers will extend such inquiry into other districts and areas.

**PATHOGENESIS.**—Almost all histologists are to-day confident of the infective nature of disseminated sclerosis, but no satisfactory demonstration of a pathogenic agent has yet been made, although claims continue to appear with monotonous regularity. Thus Steiner<sup>8, 9</sup> claims to have demonstrated spirochaetes in the tissues of animals injected with blood and/or cerebrospinal fluid from patients with disseminated sclerosis. More recently he demonstrated spirochaetes and argentophil debris in the nervous system of a patient dying from disseminated sclerosis. Analogous findings are claimed by Kallierlah.<sup>10</sup> Demonstration of spirochaetes in the cerebrospinal fluid of two patients with disseminated sclerosis was claimed by Pettit.<sup>11</sup> Adams<sup>12</sup> and his co-workers reported nervous symptoms in a number of monkeys inoculated with cerebrospinal fluid and blood from patients; in 7 out of 42 animals, spirochaete-like structures were seen. Other reports of the finding of spirochaetes in the nervous system of patients dying from disseminated sclerosis have been made by Siemerling, Buscher,<sup>13</sup> Skeer,<sup>14</sup> J. Schuster,<sup>15</sup> and Jensen and Schroeder.<sup>16</sup>

Interesting work has been done by R. M. Brickner,<sup>17, 18</sup> suggesting the presence of a myelinolytic ferment in the blood in cases of disseminated sclerosis. Pieces of rat's spinal cord were immersed in plasma from patients; myelinolysis occurred *in vitro* in much greater degree than when plasma from normal subjects was used.

Considerable attention has been directed to the claims of K. Chevassut,<sup>19</sup> who stated that she grew minute spherical bodies—often with granules attached

—by special culture of cerebrospinal fluid from patients with disseminated sclerosis. It was believed that these '*spherule insulares*' represented the actual virus of the disease; inoculation experiments were carried out in monkeys by J. A. Braxton Hicks, F. D. M. Hocking, and J. Purves-Stewart,<sup>20</sup> and a series of patients were given a 'vaccine' prepared from the 'virus'.<sup>21</sup> Considerable doubt has been expressed, however, as to the validity of these claims, although in Liverpool A. C. Ransome and H. Smith<sup>22</sup> were successful in demonstrating the 'spherula' nine times out of eleven. Not only has the technique employed been criticized, but the repeated demonstration of the 'virus' and the use of the 'vaccine' in patients who eventually proved to be suffering from disorders other than disseminated sclerosis justified the profoundest scepticism. Miss Chevassut's refusal to repeat her work under test conditions led to the view expressed in the *Lancet* for Jan. 17, 1931: "It is highly unsatisfactory that three years after Sir James Purves-Stewart began to treat patients with vaccines of the *spherula insularis*, and ten months after the discovery of the organism was announced, this simple issue should still be undetermined." Control experiments carried out by other hands fall into two groups: in the one, there is a simple failure to demonstrate the presence of the 'spherule' (E. A. Carmichael<sup>23</sup>); in the other we find that similar bodies are demonstrable not only in fluids from patients with disseminated sclerosis but in other neurological disorders as well. Such authors regard the 'spherule' not as a virus but as a flocculation or precipitation phenomenon (P. Lépine and P. Mollaret,<sup>24</sup> v. Tronconi,<sup>25</sup> J. A. Braxton Hicks and F. D. M. Hocking<sup>26</sup>).

The whole problem has been ably and critically reviewed by W. L. Holman,<sup>27</sup> who writes that the evidence from the treatment with 'virus' vaccines is as inconclusive as from all other treatments, and offers no help in support of the 'virus' hypothesis. Further, that the claims for a specific virus in this disease should be given no credence, the use of vaccines should be condemned, and some effort should be made to counteract the effect of the wide publicity given to this unreliable and improperly controlled investigation.

REFERENCES.—<sup>1</sup>*Quart. Jour. Med.* 1930, April, 343; <sup>2</sup>*Publication No. II of the Association for Research in Nervous and Mental Diseases*, 1921; <sup>3</sup>*Lancet*, 1930, ii, 19; (*Arch. u. d. neurol. Instit. u. d. Wien. Univ.* 1930, xxxii, 129); <sup>4</sup>*Brit. Med. Jour.* 1930, i, 537; <sup>5</sup>*Brain*, 1931, liii, 391; <sup>6</sup>*Med. Press and Circ.* 1931, May 6, 369; <sup>7</sup>*Arch. f. Psych. u. Nerv.* 1918, lx; <sup>8</sup>*Der Nervenarzt*, 1928, viii, 457; <sup>9</sup>*Deut. med. Woch.* 1921, xlvii, 102; <sup>10</sup>*Comptes rend. Soc. de Biol.* 1922, lxxxvi, 824; <sup>11</sup>*Quart. Jour. Med.* 1924, xvii, 129; <sup>12</sup>*Arch. f. Psych. u. Nerv.* 1921, lxii, 426; <sup>13</sup>*Munch. med. Woch.* 1921, lxviii, 425; <sup>14</sup>*Zeits. f. d. g. Neurol. u. Psychiat.* 1921, lxxv, 1; <sup>15</sup>*Rev. Neurol.* 1924, xxxi (i), 785; <sup>16</sup>*Arch. of Neurol. and Psychiat.* 1930, xxiii, 715; <sup>17</sup>*Bull. Neurol. Instit. N. York*, 1931, i, 105; <sup>18</sup>*Lancet*, 1930, i, 552; <sup>19</sup>*Ibid.* 612; <sup>20</sup>*Ibid.* 560; <sup>21</sup>*Ibid.* ii, 901; <sup>22</sup>*Proc. Roy. Soc. Med. (Sect. Neurol.)* 1931, March, 591; <sup>23</sup>*Bull. de l'Acad. de Méd.* 1931, cv, 512; <sup>24</sup>*Boll. della Soc. Med.-Chir. di Pavia*, 1931, ix, Fasc. 4; <sup>25</sup>*Lancet*, 1931, ii, 401; <sup>26</sup>*Canad. Med. Assoc. Jour.* 1931, June, 850.

## SCOLIOSIS.

E. W. Hey Groves, M.S., F.R.C.S.  
S. J. H. Griffiths, F.R.C.S.

Lateral curvature of the spine has received much attention in recent years as regards its anatomy, pathology, and treatment, but the subject is one which presents great practical difficulties.

The vertebral column becomes deviated laterally, the convex side of the curve being usually towards the right and most prominent in the dorsal region; but the deviation affects the bodies much more than the laminae of the vertebrae, and consequently there is rotation as well as lateral curvature. This rotation produces a well-marked lump of the right costal angles behind and a prominence of the left side of the chest in front. In order to maintain the erect position

the primary curve in the dorsal region is compensated by secondary curves in the cervical and lumbar spine, and these secondary curves, like the primary, are rotatory as well as lateral. The secondary lumbar curve will therefore produce a prominence of the left hip behind, and it is frequently this which first attracts the attention of the patient.

Anatomically, then, the deformity is of great complexity, for three regions of the spine are bent and twisted, involving first changes of position and relation in twenty-four bones and seventy-two joints as well as in hundreds of ligaments and muscles. At first the curve involves no more than the extreme postural changes which the normal spine can accomplish. But this is maintained by both rotation and angulation, and gradually the intervertebral discs change their shape and the ligaments become contracted or lengthened, as the case may be. Thus, at first, the patient is capable of restoring the spine to the correct shape by muscular effort; in a later stage the spine can only be straightened by external force—e.g., by suspending the patient by the head; and, lastly, the third period is reached only too soon, when no active or passive movement will correct the crooked spine. This last or fixed phase has its degrees. In the first there is little or no change seen in the bones or joints; it is a ligamentous deformity. In the second, the bones become twisted or wedge-shaped, the edges of the joints become lipped, and a condition of spondylitis or osteoarthritis complicates or terminates the condition. Another and different type of scoliosis is that due to poliomyelitis, involving the muscles of the back. The actual deformity is of the same general character, but the underlying cause is paralytic and not static.

Therefore, considered from the point of view of treatment, scoliosis may be divided into three different groups—namely: (1) The postural or functional type, where the deformity can be corrected by voluntary action or by external force; (2) The structural type, where the deformity cannot be corrected because the ligaments are shortened and the bones and intervertebral discs altered in shape; and (3) The paralytic type, where the deformity can be passively corrected, but the corrected position cannot be maintained.

**Postural Type.**—The treatment of this type implies a comprehensive programme which includes attention to the general health, habits, and clothing, combined with a course of remedial exercises over a period of many months and possibly years. The treatment aims at correcting the deformity before it has become fixed by rotation of the vertebrae and alteration in their shape. Before embarking on a course of treatment the patient should be examined for asymmetries—e.g., a myopia should be corrected by suitable glasses, or a shortening of a lower limb by raising the boot. The seating accommodation should be provided with a back-rest which reaches as high as the shoulders, and it should be at an angle of  $100^{\circ}$  to  $110^{\circ}$  with the seat. The desk for reading or writing should slope at an angle of  $45^{\circ}$ .

**Remedial Exercises.**—These should not be carried to the extent of producing fatigue or tiredness; indeed, they are things calling for recumbency. Voluntary redressment consists of voluntary correction of the deformity in front of a mirror. The hands are pressed on the iliac crests, thus stretching the spine. Klapp's crawling exercises are designed to strengthen the muscles and ligaments of the spine and to increase the mobility of the column. The patient crawls in imitation of a quadruped—that is, so that the hand and knee of one side are approximated while those of the other side are separated. The hand and knee of one side do not move forwards simultaneously. The patient first learns to crawl in a quadruped fashion in circles, progressing clockwise if the primary curve is to the right, and anticlockwise if the primary curve is to the left.

**Structural Type.**—The treatment of structural scoliosis presents a more serious and less encouraging problem. Sir Robert Jones schematizes the treatment in the following way: (1) Gymnastics alone; (2) Gymnastics and corsets; (3) Gymnastics and stretching; (4) Gymnastics and corsets and stretching; (5) Forcible correction.

*Gymnastics* is all that is necessary for mild cases. There should be progressive improvement, and if there is not, then either the exercises are done improperly, or the case is too severe for gymnastics alone. There are many borderline cases in which it is impossible to tell at the outset whether gymnastics alone will be sufficient. If in doubt, start with gymnastics and keep them up as long as there is definite improvement or the condition is controlled. If the rotation of the bodies is marked then gymnastics alone will be ineffectual.

*Braces or Corsets.*—If the muscular condition is good, and if the patient can and will carry out remedial exercises thoroughly, then he is much better off if he is unrestricted by any apparatus. But in the case of men and women who must lead sedentary lives, and especially in paralytic conditions, a light brace certainly will help—not to cure the deformity, but to prevent its getting worse. If, therefore, there is definite paralysis, or if there is evidence that in spite of remedial exercises the deformity is increasing, then a brace should be worn. A light steel brace is much better than a corset, because it does not restrict the muscle movements. It must have a firm bearing on a pelvic band from which rises a double steel along the mid-line of the back. A crutch should support the axilla on the concave side of the main curve, and in addition a lateral pad or support should press against the dorsal convexity or hump on the convex side.

*The Methods of Forcible Correction and Plaster.*—These involve a long and painful method of treatment and are seldom worth while because of the uncertainty of the results. The patient is placed in a metal frame and the spine forcibly extended and rotated, the whole trunk being encased in plaster with a thick felt pad over the hump at the back on the side. When the plaster has set a window is cut behind over the back on the concave side where the chest has fallen in. The effect of this is to push in the convexity and allow the concavity to expand. Every three months the plaster is renewed and a further correction attempted. The course of treatment occupies one or two years.

*Passive Stretching.*—This is accomplished by means of a Sayre's head-sling. The cord is attached to a compound pulley, and the patient holds the rope, exerting such traction that the weight of the body is taken by the head-sling and the position of tiptoe induced. Whilst the patient is in this position a plaster jacket, well padded and carefully moulded around the bony points, may be applied. This should not be done in the out-patient department, for occasionally one sees considerable respiratory embarrassment coming on some hours after the application of a jacket. The patient should be kept under close observation for at least twenty-four hours, so that in the event of such a complication arising relief may at once be forthcoming. Abbott's method consists in suspending the patient in a canvas hammock with the spine in flexion. Lateral and rotating corrective force is obtained by means of canvas slings, and a plaster is applied. When the plaster is dry, large windows are cut over the convexity and pressure pads are inserted. C. W. Peabody describes an apparatus which consists of a celluloid pelvic girdle to which are fixed two steel uprights, anterior and posterior, on the side opposite the major curve. Lateral traction is obtained by straps placed high and low pulling against a leather band. The steel uprights are joined together by a bar passing under the axilla. The apparatus is easily removable, and can be adjusted without much trouble. It is well tolerated in hot weather.



*The Fixation Operation.*—This, which is associated with the name of Hibbs, is especially designed for two kinds of cases—namely, that which is definitely getting worse in the degree of deformity and the occurrence of pain, and the paralytic case which cannot be controlled by a brace. The operation consists in an exposure of a long area of the vertebral column, practically the whole primary curve and its junction below with the secondary curve. This means, in effect, the greater part of the dorsal and the upper lumbar spine. In the whole of this area the spinous processes are fractured and made to lie against one another, and the intervertebral joints in the laminae are fused by chipping off their articular surfaces.

Hibbs and Risser have examined the results obtained in 360 cases of scoliosis treated by operation to obtain fusion. There were 7 deaths in the series, giving a mortality of 1.3 per cent; 44 per cent of the cases were due to infantile paralysis, and 186 cases were of undetermined etiology, but there was no evidence that rickets caused the curve. The average age at operation was 16. The cases are divided into three chronological groups based on differences in treatment. In the first period 1914–19 body jackets and traction were used pre-operatively, and a removable support with or without lateral pressure for eight weeks after operation. From 1919–23 a short body jacket with lateral hinge and turn-buckle for wedging were used. These were removed at the time of operation, and replaced fourteen days after the operation and worn for eight weeks, after which the patient was allowed up in a removable jacket, which was worn for six to twelve months. In the last period 1923–7 a fixed jacket was worn for five to twelve months after the operation, and the authors' present procedure is to obtain maximum correction by means of an antero-posterior hinge turn-buckle jacket combined with head and pelvic traction, and to operate through a window, which procedure, although it may involve two or three operations (fusing a few segments at a time), prevents loss of any of the correction obtained.

Seventy-nine per cent of the cases were followed up, the amount of correction obtained was measured by X-ray comparisons, and the average correction obtained was  $15^{\circ}$  to  $20^{\circ}$ . Twenty-three per cent of the cases examined had maintained  $5^{\circ}$  to  $15^{\circ}$  of the correction, and this result increased from 4 per cent in the first group to 42 per cent in the third. Increase in the curve outside the area of fusion was due to an insufficient number of vertebrae being included. This error was reduced from 31 per cent in Group 1 to 12 per cent in Group 3. There was no increase in deformity in 50 per cent of patients. Pseudo-arthritis, recognized by fatigue, pain, and tenderness to deep pressure, was suspected in 15 cases. In 7 of them operation demonstrated it and the pseudo-arthritis was repaired.

Hibbs and Risser stress the importance of selecting the right area for fusion operation, pointing out that fusion of the secondary curve alone is useless as it results in increase of the primary curve. This is especially important in early paralytic high dorsal curves. Eighteen of the patients were operated on because of pain in the back; 15 were entirely relieved, and 3 partially. Their average age was 20 to 30. All stated that they felt better afterwards and could work longer and with less fatigue. Identification of vertebrae at operation, which is very important, is obtained by marking the skin over a vertebral spine with silver nitrate and then placing a lead pointer over the mark and taking an X-ray. The authors conclude that spine fusion is indicated in the treatment of scoliosis: (1) To prevent increase of deformity; (2) To maintain previously gained correction; (3) To relieve pain.

*BIBLIOGRAPHY.*—Jones and Lovett, *Orthopedic Surgery*, 2nd ed.; C. W. Peabody, *Jour. Bone and Joint Surg.* 1931, Jan.; Russell Hibbs, *Ibid.* 1924, Jan.; Hibbs and Risser, *Ibid.* 1931, Jan.

**SCURVY IN ADULTS.***Stanley Davidson, M.D., F.R.C.P.E.*

S. R. Mettler, G. R. Minot, and W. C. Townsend,<sup>1</sup> in a carefully controlled investigation, clearly show that the anæmia of scurvy reacts specifically to treatment with **Vitamin C** (fruits, green vegetables, and fresh liver) with a typical reticulocyte response, but completely fails to respond to large doses of iron or liver extract. In addition the authors discuss the important part played by infectious processes and arteriosclerosis in precipitating or intensifying a deficiency disorder in an individual with chronic nutritional instability.

REFERENCE.—<sup>1</sup>*Jour. Amer. Med. Assoc.* 1930, Oct., 1089.

**SEA-SICKNESS.***Robert Hutchison, M.D., F.R.C.P.*

The pathogeny of sea-sickness is still obscure, and a discussion on the subject at the meeting of the British Medical Association at Winnipeg in 1930, and another on air-sickness and sea-sickness in the United Services Section of the Royal Society of Medicine in November, 1930, have not thrown much light upon it. In the former of these discussions T. G. Maitland<sup>1</sup> described the results of observations and experiments, facilities for which had been granted by the Cunard Company. His paper deals with the ocular disturbances in sea-sickness and with alterations in the pulse-rate and blood-pressure. It does not lend itself to summary, and his general conclusions are rather vague.

As regards the theory that ketosis may be the cause of sea-sickness, J. R. Marrack<sup>2</sup> finds—as might have been expected—that although ketosis is usual in sea-sickness after vomiting has begun, and occasionally appears earlier, it is not the cause of any of the symptoms and is to be regarded as evidence of some metabolic disturbance the nature of which is unknown.

M. Flack,<sup>3</sup> who also took part in the Cunard investigation, comes to the following provisional conclusions: (1) Sea-sickness is predominantly of vestibular origin due to uneven movement. (2) In certain cases where the labyrinths are unduly sensitive vomiting may occur early, due to reflex stimulation of the vagus motor fibres to the stomach. Such cases are of the type which are also liable to air-sickness. (3) In cases of sea-sickness where the labyrinth cannot be deemed unduly sensitive, its stimulation early induces or aggravates a degree of ocular muscle imbalance, which, combined with the continued stimulation of the vestibular apparatus, serves to provoke further symptoms. (4) Generally speaking, subjects in whom eye muscle imbalance is not induced or aggravated do not suffer from sea-sickness, although a slow pulse and a lowered blood-pressure may cause a feeling of 'limpness'.

There is obviously nothing very new in this. E. P. Poulton, however, pointed out in the discussion that if disturbance of the labyrinth were the all-important factor, one would expect nystagmus and vertigo to be constant symptoms of sea-sickness, but they are not. He is of opinion, from his own experiments, that the nausea and sinking sensation at least are due to tension exerted on end-organs in the œsophageal wall by up-and-down movements, but admits that this is not the whole thing. Some of the sensations in the head, for instance, might be due to an ebbing and flowing of the cerebrospinal fluid as the ship moved up and down.

None of the speakers had anything new to say about treatment. As Flack said, there seems to be no 'blunderbuss' remedy for its prevention. The most likely one would be a drug which depresses the centres into which the afferent impulses stream, combined with large doses of alkali and bromide and perhaps sugar and a little flavouring of alcohol. In reality, however, each case requires a proper medical examination and treatment on its merits. Not very helpful!

REFERENCES.—<sup>1</sup>*Brit. Med. Jour.* 1931, i, 171; <sup>2</sup>*Ibid.* 178; <sup>3</sup>*Ibid.* 176, and *Proc. Roy. Soc. Med.* 1931, March, 635.

**SEMINAL VESICLES, DISEASES OF.**

*Sir John Thomson-Walker, F.R.C.S.*

R. S. Roper,<sup>1</sup> in an exhaustive paper dealing with gonococcal infection of the seminal vesicles, describes an instrument that he has had made for the purpose of catheterization of the ejaculatory ducts. He considers the anatomy of the seminal vesicles, ampullæ of the vasa deferentia, and the ejaculatory ducts in detail, and gives illustrations of seminal vesiculograms carried out in a number of post-mortem specimens by the injection of lipiodol. He is of opinion that infection of the seminal vesicles in cases of gonorrhœa is much more frequent than is usually supposed, and he discusses the diagnosis and conservative treatment fully. As regards operative treatment, vasostomy, vasopuncture, and vasotomy are considered, and of these procedures the writer indicates the last as being the method of choice. He reports a bilateral case successfully treated by this means. He does not consider that direct catheterization of the ejaculatory ducts and lavage of the vesicles are practicable at the present time, and gives the following indications for **Vasotomy**: (1) In protracted cases lasting over five months in which other treatment has been tried, and especially if rheumatism is present; (2) In resistant cases in which, owing to a deep perineum, it is impossible to massage the vesicles efficiently; (3) In cases where the co-operation of the patient is doubtful during a long course of treatment, and where the disease hinders him from continuing his occupation; (4) Where sterility is already established by previous double epididymitis.

F. Kidd<sup>2</sup> records a case in which he catheterized the right ejaculatory duct and obtained a right seminal vesiculogram using sodium iodide solution. He considers that in carefully selected cases catheterization of the seminal vesicles may be indicated in patients who wish to know if their ejaculatory ducts are patent after prolonged attacks of vesiculitis, and in those cases of vesiculitis in which it is necessary to know if any area remains in the vesicle where infected secretion may be loculated and may prove to be a source of re-infection at a later date. He hopes that with further experience it may be possible to wash out the vesicles by this method and so cure cases of chronic vesiculitis. At present he performs open vasostomy after the method of Belfield, which permits of lavage of the vesicles from above, and states that he has carried out this method with almost uniform success in more than seventy selected cases.

W. S. Pugh<sup>3</sup> says that he has been disappointed with the results obtained after vasotomy in cases of seminal vesiculitis, in that of 365 operations for this condition, carefully followed up and treated with all possible care, he was forced to regard 65 per cent as failures. The reason for this he attributes to the fact that, whereas by this operation medication can be applied to the interior of the vesicle only, the disease is actually both inside and around the organ. He considers that in cases of vesiculitis there is not uncommonly perivesiculitis comparable to the pelvic cellulitis so common in association with inflammation of the female adnexa.

REFERENCES.—<sup>1</sup>*Lancet*, 1931, April 11, 793; <sup>2</sup>*Ibid.* April 18, 864; <sup>3</sup>*Med. Jour. and Rec.* 1931, April 15, 383.

**SEPTICÆMIA.**

*Sir W. I. de C. Wheeler, F.R.C.S.I.*

In the treatment of this condition, assuming that there is no accessible primary focus and that the organism is the streptococcus, **Serum** is the sheet-anchor. The reviewer does not use such substances as mercurochrome and gentian violet unless every other treatment has been tried without success: 20 c.c. of a 1 per cent solution of **Mercurochrome** given intravenously on two or three consecutive days is recommended by some. Large quantities of

10 per cent **Dextrose** solution, 3000 or 4000 c.c. daily, may be given continuously by the drip method through a cannula into the internal saphenous or cephalic vein, or in divided doses through a needle into the veins of the arm. Tap water can be administered with advantage by the drip method into the rectum, or saline solution into the subcutaneous tissues of the breast. Such methods assist in the dilution and elimination of toxins. Murphy's arguments in favour of ample fluids were not confined to cases of septic peritonitis. Patients suffering from infection of the blood-stream respond better when treated in the open air.

J. H. Jopson and J. Eiman<sup>1</sup> summarize their paper thus: (1) An analysis of 43 cases of hæmolytic streptococcus blood-stream infections shows that polyvalent antistreptococcic serum is of a decided value in treatment. (2) Twenty-one cases received no serum, 4 cases received insufficient amounts and in late stages: 5 cases (21 per cent) recovered; 19 cases (79 per cent) died. (3) Nineteen cases were treated under conditions which were satisfactory for the test of the value of the serum: 4 cases (21 per cent) died and 15 (79 per cent) recovered. (4) The serum had no effect on either primary or secondary foci and infected thrombi in the circulation.

In an interesting paper these writers state that there is no question of the failure of the old monovalent serum to reduce mortality. There are a number of strains of hæmolytic streptococcus which react differently to biological tests, consequently the use of a polyvalent serum is imperative. It does not exert any beneficial action either on primary or secondary foci. Such foci must be treated surgically. The best results with the serum are obtained when it is administered early and in sufficient quantities intravenously. The patient should be questioned about previous injections of serums, such as diphtheria or tetanus antitoxin, in case of producing anaphylaxis. In order to guard against anaphylaxis and to carry out the skin test, inject intradermally about 1 c.c. of the serum so as to produce a wheal. If the test is positive, in ten or fifteen minutes the wheal will increase considerably in size and will be surrounded by a fairly wide zone of hyperæmia. If negative, this does not occur. If the test is negative, one may proceed with the intravenous injection of the serum. Nevertheless, the first dose intravenously should be given with extreme care. Dilute the serum with physiological salt solution, about 1-20, and introduce it very slowly, so that the patient does not receive more than 20 c.c. of the diluted serum in the first ten minutes. Should anaphylactic shock develop, adrenalin and atropine sulphate should be injected. Twenty-five or 50 c.c. are recommended at the first injection and 50 or 100 c.c. at a later time. It is better to give two or three smaller injections in twenty-four hours than one large dose. One should plan to administer all the serum within six days.

**Staphylococcus Septicæmia.**—P. S. Lowenstein<sup>2</sup> points out that this is a condition fraught with the gravest consequences to the individual. The treatment is highly unsatisfactory. As soon as the staphylococcus is cultured from the blood, vaccination of a suitable donor should be begun, so that transfusions of immunized blood may be given at the earliest practical moment. Although the value of staphylococcus antitoxin is still in doubt, it should be used in large quantities intravenously and intramuscularly.

REFERENCES.—<sup>1</sup>*Ann. of Surg.* 1930, Nov., 910; <sup>2</sup>*Amer. Jour. Med. Sci.* 1931, Feb., 196.

### **SERRATUS MAGNUS PALSY.** *Macdonald Critchley, M.D., F.R.C.P.*

Isolated paralysis of the serratus magnus muscle is occasionally encountered in clinical practice, and is of interest not only because of the problems of etiology but also on account of the interesting symptomatology so produced. Two chief types of affection of the long thoracic nerve of Bell appear responsible.

In the first place there exists a group of cases in which a previous toxi-infectious malady has been followed by serratus magnus paresis; in this group belong the post-enteric cases of C. Bäumler<sup>1</sup> and of A. Souques and J. Castaigne.<sup>2</sup> Others have followed measles (G. Bertrand and M. Chailly<sup>3</sup>); puerperal fever (L. Weber<sup>4</sup>); influenza (M. Bernhardt,<sup>5</sup> C. v. Rad,<sup>6</sup> G. Guillaïn and E. Libert,<sup>7</sup> A. Tournay and W. M. Kraus<sup>8</sup>); and injection of antitetanic serum (A. Baudouin and J. Hervy<sup>9</sup>). Signs of bronchopneumonia have sometimes been present in these post-infectious palsies; a point of great interest is that all the recorded cases of this type—with but one exception—have occurred on the right side. The second chief group of cases are those where the palsy does not follow an infectious disease; in many of these there is a history—which may be recent or remote—of excessive use of muscular movements of the arm. Thus the cases of Wiesner,<sup>10</sup> Woodman,<sup>11</sup> Bernhardt Buchmüller,<sup>12</sup> and Barreïro,<sup>13</sup> are illustrative in this connection. Serratus magnus palsy has also been seen in swimmers (Wilfred Harris<sup>14</sup>), as in one case recently under observation, suggesting a possible trauma to the scalenus medius or to the roots of the long thoracic nerves in relation to that muscle. J. D. Ellis<sup>15</sup> mentions serratus magnus paralysis after prolonged elevation of the arms, as from painting a ceiling or hanging from a cross-bar.

The symptomatology of serratus magnus paralysis has been well expounded by Tournay and Kraus. In the post-infectious cases pain may be present in the affected shoulder, axilla, and chest. This is followed by difficulty in raising the arm and by visible winging of the shoulder-blade. Tenderness is present over the course of the nerve of Bell, the maximal point being the mid-axillary line in the fourth intercostal space.

Difficulty in raising the arm above a right angle, together with winging of the scapula, constitute the two conspicuous signs of serratus magnus palsy. There are, however, numerous minor signs of this disorder which serve to differentiate it from trapezius paralysis. Tournay and Kraus have set out the total fifteen 'positive' signs as follows:—

1. Pain in the shoulder and axilla, with tenderness in the fourth interspace in the mid-axillary line.
2. Reaction of degeneration in the affected muscle.
3. The arm cannot be raised above the horizontal. (It is perhaps more accurate to say that the arm can usually be raised just a little above the horizontal. Steinhauser, who in 1900 collected 57 cases from the records of the German Army, found elevation of the arm a little beyond 90° in 95 per cent.)
4. The scapula is sometimes higher on the paralysed side, when the arms are pendent and at rest.
5. The affected shoulder is sometimes lower when the patient is at rest; it is higher when the scapulae are brought to the mid-line.
6. The sternomastoid and trapezius are more forcibly contracted on the paralysed side when the arms are abducted.
7. The lateral contour of the chest forms an S-shaped curve on the affected side (Souques' sign<sup>16</sup>).
8. The axillary outline, as viewed with the arms abducted, is round rather than angular. (This is part of the S-curve of Souques.)
9. The affected side of the chest is smaller.
10. When the patient lifts the shoulder forcibly, the supraclavicular fossa is narrower and more perpendicular on the affected side. (Guillaïn and Libert's sign.)
11. Winging of the scapula is produced by lifting the arm or by forceful pushing against an object (*Plate LIX*).

12. Souques and Castaigne's sign : when the arms are carried forward and protracted, two troughs form in the lowermost fibres of the trapezius, the medial one being long and narrow and the lateral one being pyramidal in shape.

13. The affected scapula is nearer the mid-line and may overlap the vertebral column when the arms are abducted. (N.B.—In trapezius paralysis the scapula is farther from the mid-line than normal—Souques and Duval<sup>17</sup>).

14. A mild degree of scoliosis may exist.

15. Tournay and Kraus also draw attention to the two following signs : (a) The patient shows, when examined from behind, lengthening of the line between the deltoid and trapezius. (b) When the patient is viewed from the front, while shrugging the shoulders, a shortening of the line between deltoid and sternomastoid becomes evident (*Plate LX*).

16. To these signs indicated by Tournay and Kraus may be added deviation of the point of the chin to the opposite side.

In addition to the above positive signs, certain negative features may be emphasized. Thus, the deltoid, rhomboids, trapezius, pectorals, and rotators of the upper arm are all demonstrably unaffected. There is no alteration in the biceps, triceps, or supinator reflexes in the upper limb ; lastly there is no objective sensory impairment.

**PATHOGENESIS.**—The anatomical details of formation and course of the long thoracic nerve may throw light on the causation of isolated paralysis of the muscle it supplies. It arises from the 5th, 6th, and 7th cervical nerves, the upper two piercing the scalenus medius, while the lowest one passes in front of this muscle. The three roots unite at the level of the first rib to form a single trunk which descends along the inner wall of the axilla behind the brachial plexus and axillary vessels, and upon the lateral aspect of the serratus magnus, to which it is distributed. The nerve is liable to damage : (1) in the supra-scapular region from sudden or protracted trauma, e.g., the carrying of heavy weights on the shoulder, (2) in the axilla from direct force, (3) at the level of the union of the three roots, from abnormalities of the first rib, (4) from violent contractions of the scalenus medius muscle, as in swimming, and (5) possibly in the axilla from the pressure of enlarged lymphatic glands.

**REFERENCES.**—<sup>1</sup>*Deut. Arch. f. klin. Med.* 1880, 305 ; <sup>2</sup>*Nouv. Icon. Salp.* 1899, xii, 178 ; <sup>3</sup>*Presse méd.* 1909, 611 ; <sup>4</sup>*Deut. med. Woch.* 1880, 277 ; <sup>5</sup>*Arch. f. klin. Med.* 1879, 380 ; <sup>6</sup>*Munch. med. Woch.* 1898, 1145 ; <sup>7</sup>*Ann. de Méd.* 1820, vii, 383 ; <sup>8</sup>*Jour. Neurol. and Psychopathol.* 1924-5, v, 115 ; <sup>9</sup>*Rev. neurol.* 1931, March, 306 ; <sup>10</sup>*Arch. f. klin. Med.* 1869, vi, 95 ; <sup>11</sup>*Brit. Med. Jour.* 1875, Oct. 7 ; <sup>12</sup>*Inaug. Dissert.*, Erlangen, 1892 ; <sup>13</sup>*Thèse de Paris*, 1895 ; <sup>14</sup>*Neuritis and Neuralgia*, 1926, 75, London ; <sup>15</sup>*Arch. Neurol. and Psychiat.* 1929, xxii, 1233 ; <sup>16</sup>*Bull. Soc. méd. Hôp. de Paris*, 1898, Oct. 32, 682 ; <sup>17</sup>*Nouv. Icon. Salp.* 1898, xi, 410.

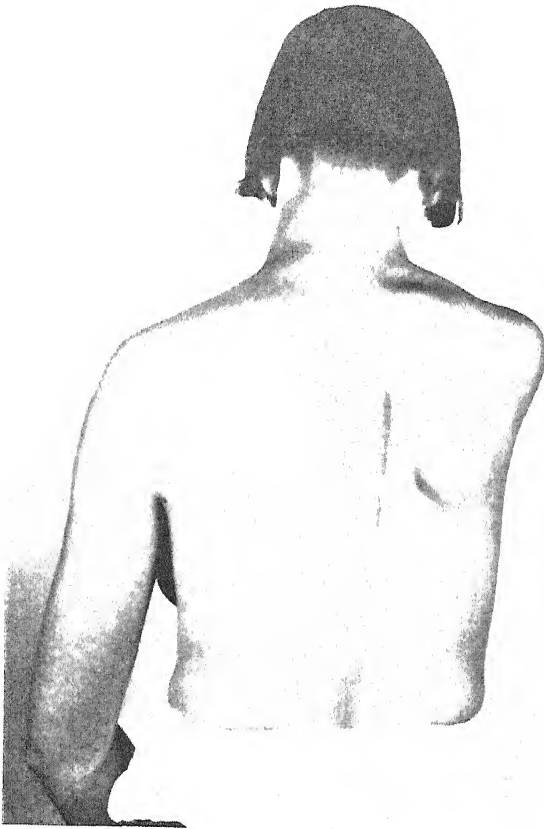
## SERUM SICKNESS.

J. D. Rolleston, M.D., F.R.C.P.

**SYMPTOMS AND COMPLICATIONS.**—J. C. S. Bailey<sup>1</sup> reports a case of *severe serum reaction* following desensitization in a boy, age 10, who contracted diphtheria seventeen days after prophylactic injection of 1500 units of antitoxin. An attempt at desensitization was made by injection first of 0.12 c.c. antitoxin with no reaction, followed in half an hour by 0.25 c.c. and then 0.5, 1, and 2 c.c. every half hour. Two hours after the last injection patches of erythema and urticaria appeared on various parts of the trunk. Vomiting began and the patient had two loose stools. His face and extremities were cyanosed, and the pulse could not be felt. A subcutaneous injection of 1300 c.c. of saline was given and the temperature rose from 101° to 106°. Next day the patient had a generalized morbilliform rash and slight enlargement of the cervical glands, but the following day the rash disappeared and the temperature was only 99°. Recovery took place without further antitoxin.

*PLATE LIX*

SERRATUS MAGNUS PALSY

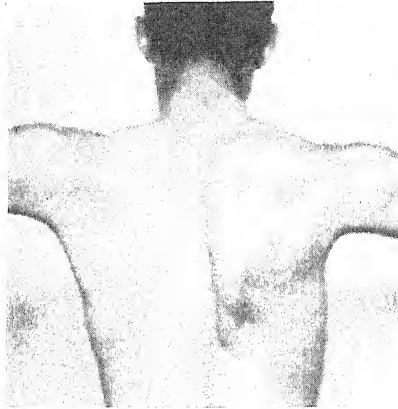


Winging of the scapula from serratus magnus palsy.

## PLATE LX

### SERRATUS MAGNUS PALSY—*continued*

(A. TOURNAY AND W. M. KRAUS)



*Fig. A.*—Paralysis of the serratus magnus. Trapezius-deltoid line is longer on affected side. Note also: Winging to some degree; Trapezius sign of Souques and Castaigne; Uppermost fibres of trapezius are more forcibly contracted on paralysed side; Scapula overlaps slightly the vertebral column; S curve of Souques very evident.



*Fig. B.*—Same case as *Fig. A.* Shortening of sternocleidomastoid-deltoid line on affected side. Note also: Narrowing and perpendicular direction of supraclavicular fossa on patient's right (sign of Guillain and Libert); Deltoids normal.

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**PROPHYLAXIS.**—B. Schick<sup>2</sup> emphasizes the importance of prophylaxis against serum sickness by deprecating unnecessary injections of serum, e.g., passive immunization of all the members of a family when one of them has contracted diphtheria or scarlet fever. The increasing tendency to inject all cases of scarlet fever with antitoxin he regards as undesirable, as does also the reviewer (see MEDICAL ANNUAL, 1931, p. 423). Some sera, especially tetanus antitoxin, are more likely to give rise to toxic symptoms than others, but the rarity of fatal cases is shown by the fact that though Lamson has collected 41 cases from the literature, Pfaundler had only 3 fatalities among 1,000,000 injected, and Park only 1 among 50,000. [The reviewer in over thirty years' fever hospital experience has seen several cases of severe anaphylaxis, but has never observed a fatal case.—J. D. R.] The persons exposed to special risk are: (1) Asthmatic subjects, especially those who are hypersensitive to emanations from horses; (2) Persons who have previously had prophylactic or therapeutic injections of serum. Before injection, therefore, an inquiry should be made whether the individual is the subject of asthma or any other allergic disease or whether he has had any previous injections of serum. Sensitiveness from horse serum should be tested by diluting the antitoxin 1–10 with normal saline and then injecting 0.05 c.c. intracutaneously, especially before intravenous or intra-theal administration of serum. A solution of **Adrenalin** (1–1000) should always be at hand for use in such cases.

REFERENCES.—<sup>1</sup>*Arch. of Pediatrics*, 1931, 338; <sup>2</sup>*Kinderärztl. Praxis*, 1930, 12.

## SHOULDER-JOINT INJURIES.

E. W. Hey Groves, M.S., F.R.C.S.

S. J. H. Griffiths, F.R.C.S.

**Rupture of the Supraspinatus Tendon.**—The recognition of injuries in the region of the shoulder-joint is one of considerable importance. A large number of such cases occur in the course of employment and are commonly met with during examination under the Workmen's Compensation Act. E. A. Codman,<sup>1</sup> of Boston, has made an exhaustive study of these injuries and has analysed 500 cases, the diagnoses of which he tabulates as follows:—

Trivial or no diagnosis .. .. .	100
Acute subacromial bursitis .. .. .	6
Adherent subacromial bursitis .. .. .	17
Fringes and bands in bursa .. .. .	14
Calcified deposits .. .. .	25
Fractures of the tuberosity .. .. .	26
Extensive fractures .. .. .	38
Circumflex and other nerve injuries .. .. .	36
Constitutional arthritis .. .. .	13
Ruptured biceps .. .. .	9
Ruptured supraspinatus .. .. .	122
Acromioclavicular arthritis or dislocation .. .. .	30
Malingering .. .. .	7
Hysteria .. .. .	21
Miscellaneous rare cases .. .. .	36
Total .. .. .	500

From the above table it will be seen that the commonest injury is a rupture of the supraspinatus tendon, and Codman goes as far as to say that this is the most common industrial injury causing prolonged shoulder-joint disability, and that more lost working days are charged to it than to all the other industrial shoulder injuries combined. This is rather astounding, especially when one observes that the English text-books scarcely recognize the condition as a separate clinical entity. As the result of a long-continued study following on Codman's description of traumatic subacromial bursitis, to which his name has been applied, he is able to state that the condition can be

diagnosed with considerable certainty, and he has been able to verify his diagnosis either by operation or on the cadaver.

Many authors have written about lesions of the subacromial bursa, and, in spite of an abundant literature, with the exception of Codman and P. D. Wilson, of Boston, very few have recognized the importance of rupture of the supraspinatus tendon. Wilson<sup>2</sup> describes the etiology and pathology of the lesion with clarity.

The supraspinatus tendon forms not only the roof of the shoulder-joint but the floor of the subacromial bursa. The object of this bursa is to facilitate movement of the great tuberosity under the acromial process in the movements of abduction and adduction. It is close to its insertion into the great tuberosity that the tendon ruptures and the gap from the contracted muscle creates an opening of greater or lesser extent through which this bursa communicates with the shoulder-joint. This enables the bursa to enlarge, and in so doing it penetrates under the deltoid muscle, and this is the commonest cause of subdeltoid bursitis (Codman).

Rupture of the supraspinatus tendon is a lesion of the adult; Wilson's youngest patient was 35. There is always a history of adequate trauma and trauma of a kind which would tend to produce a dislocation. Rarely, if ever, is the violence direct, the typical injury being a fall on the outstretched arm. The patient may feel a snap in the shoulder-joint, and the pain, though lancinating for the moment, may not be sufficient for him to stop work. He stops work some few days or weeks later owing to weakness of the shoulder-joint. On examination at this stage there is found atrophy of the muscles about the shoulder-joint, especially the supraspinatus and the infraspinatus, although the deltoid may show some compensatory hypertrophy. There is localized tenderness over the tip of the great tuberosity of the humerus, and just medial to this a sulcus corresponding to the gap of the ruptured tendon may be palpated. This point of tenderness disappears when the tuberosity passes under the acromion, and in so doing there is a gap or catch of coarse crepitation. Contrary to what one would expect, there is no great restriction of movement, though the patient will not voluntarily raise the arm above the shoulder level. If he attempts to do so, there is an interruption of the normal scapulo-humeral rhythm. The scapula and the humerus will move together for part of the way. There is then a catch, and the humeral joint acting alone will raise the arm to a complete position. This change in the rhythm occurs as the tuberosity passes under the acromion process.

X-ray examination shows nothing conclusive, though stereoscopic skiagrams when compared with the normal side show a roughening or rounding off of the tip of the great tuberosity. Codman urges early diagnosis and early operative interference for suture of the tendon. From the very nature of the lesion physiotherapy can be of little help, and he concludes his paper with the remark that when the profession in general have realized the importance of this lesion it will be time enough to discuss the operative technique.

Wilson in his paper discusses the operative details. There are certain technical difficulties to be overcome in order that a serviceable function may result. The gap or rent in the tendon may be considerable, and the approximation of the retracted tendon to the great tuberosity is a procedure of great difficulty. He advises an incision over the top of the shoulder from the acromio-clavicular joint. The articulation is divided and the base of the acromion cut through with a Gigli saw. This gives a wide and adequate exposure of the rent in the shoulder-joint. The ruptured or avulsed tendon is then fixed to the great tuberosity by strips of fascia lata passing through holes drilled in the great tuberosity.

**Habitual or Recurring Dislocation of the Shoulder-joint.**—This is a more disabling condition than is generally imagined. The actual and functional disablement of such a joint is often great enough to prevent the victim's partaking in manual work. There has been much speculation as to its exact pathology, but all are agreed that the essential lesion consists of a tearing of the capsule in its lower or anterior aspect. Whether it is an actual hole in the capsule or a tearing from the cotyloid ligament is of little importance.

Many ingenious operations have been devised for the relief of this condition, and these range in severity from an arthrodesis of the shoulder-joint to a simple capsulorrhaphy. The popularly accepted operation is one which was devised by Clairmont.<sup>3</sup> A strip of the deltoid muscle is isolated and separated from its insertion. This strip is drawn from behind forward through the quadrilateral space and sewn in front either to the edge of the deltoid or to the subscapularis tendon. It is claimed that this strip acts simultaneously with the deltoid and slings the neck of the humerus upwards. There is no evidence to show that this is so, and it is extremely unlikely that this isolated strip of muscle functions at all. Indeed, it is probably converted to a thin fibrous strand and acts as a mere pad or sling to the humerus.

Hey Groves has described a method which is at once simple and effective. His method, described in detail in the *MEDICAL ANNUAL* of 1925 (p. 232), consists in making three incisions; one in front below the tip of the coracoid; the second behind the posterior border of the deltoid; and the third over the tip of the acromion. A strip of fascia lata 12 in. long and 2 in. wide is cut from the thigh. This strip is drawn from the anterior to the posterior incision, and then the two ends are drawn up through the superior one and tied tightly over the acromion process. This strip is in direct contact with the head of the humerus covered by the subscapularis tendon in front. The efficiency of this method has now been proved in a number of cases, and one of Hey Groves's early cases was able to return to his full work as a blacksmith's striker.

A similar but somewhat more complicated method has been described by M. S. Henderson,<sup>4</sup> of Rochester, Min., but no mention or reference to Hey Groves's method has been made. Henderson arbitrarily divides the operations devised for this distressing condition into five: (1) Operations on the bony structures, e.g., arthrodesis and excision of the head of the bone. (2) Operations on the capsule, e.g., anterior capsulorrhaphy for posterior dislocations. (3) Muscle transference, e.g., Clairmont's well-known operation and Haymenn's<sup>5</sup> method of transplanting the short head of the biceps from the coracoid process to the upper rim of the glenoid fossa. (4) Check and block operations, which consist of slitting the coracoid process and elongating it as described by Oudare<sup>6</sup> so that the head impinges on this block as it attempts to slip downwards. (5) Suspension operations. The latter is the method advocated by Henderson, and does not differ materially from Hey Groves's method. Henderson utilizes a piece of the peroneus longus tendon and he expresses the opinion that the fascia lata is inadequate to stand the strain. Parallel holes are drilled through the acromion process and through the head of the humerus, and the two bones are slung together and the isolated piece of the peroneus tendon passed through the parallel holes. He has performed Clairmont's operation on eight patients, but only 50 per cent were cured. His method of teno-suspension has been performed by him on ten cases and has resulted in a 100 per cent cure. It is interesting to note that in his series of ten cases in three of them less than a year has elapsed since the operation, and his longest case is only just over five years since operation.

REFERENCES.—*Surg., Gynecol. and Obst.* 1931, Feb., 579; <sup>2</sup>*Jour. Amer. Med. Assoc.* 1931, Feb. 7, 433; <sup>3</sup>*Wien. klin. Woch.* 1917, 411; <sup>4</sup>*Jour. Amer. Med. Assoc.* 1930, Nov. 29, 1653; <sup>5</sup>*Zentralb. f. Chir.* 1927, 1411; <sup>6</sup>*Presse méd.* 1928, Feb. 15, 201.

**SILICOSIS.** (*See INDUSTRIAL DISEASES ; PNEUMONOCOINOSSES.*)

**SKIN.** (*See also ACNE VULGARIS ; ACRODERMATITIS CONTINUA VEL PERSTANS ; ALOPECIA AREATA ; CHILBLAINS ; DERMATITIS VENENATA ; ECZEMA ; ERYSIPELOID ; HERPES ZOSTER ; LUPUS ERYTHEMATOSUS ; PEMPHIGUS ; SCABIES ; URTICARIA ; VARICOSE ULCERS ; XANTHOMA.*)

**SKIN, FUNGOUS AFFECTIONS OF.**

*A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.*

**Ringworm.—**

**DIAGNOSIS.**—In the MEDICAL ANNUAL for 1928 (p. 429) attention was called to the phenomenon of *fluorescence* which some hairs infected with ringworm showed when examined with ultra-violet light. The apparatus employed is a mercury vapour lamp, the rays from which are passed through a screen of glass containing nickel oxide and known as Wood's glass. This method of diagnosis is largely used and has proved an invaluable aid. Its limitations, however, require to be stressed. J. Kinnear<sup>1</sup> has made a useful contribution to the subject. He calls attention to the fact that though the hairs of microsporon ringworm fluoresce vividly, yet those of endothrix and ectothrix ringworm do not. Though many dermatologists are aware of this fact, it is not so well known generally as it should be. It so happens that microsporon ringworm accounts for some 90 per cent of cases of scalp ringworm in this country, but as endothrix cases are perhaps the least easily recognized of scalp ringworm cases, it is necessary to make a careful examination of the scalp by the older methods and not to rely exclusively on the Wood's glass method of diagnosis. Ectothrix cases offer less difficulty, as they usually appear as cases of kerion, which are easily recognized. Kinnear finds a pale white fluorescence in favus hairs, but this is not so characteristic as is that of microsporon hairs. The method is quite useless in body ringworm.

**TREATMENT.**—G. Roche Lynch and J. M. S. Scovell,<sup>2</sup> in an exhaustive paper, discuss the action and toxicology of **Thallium**. They describe a number of fatal cases of thallium poisoning, some of which occurred as a result of accidental over-dosage when given for ringworm, and others either from the administration of zelio-corn and zelio-paste, preparations containing thallium, used in Germany as rat poisons, either accidentally or criminally, or among industrial workers handling this substance. In addition, they quote three deaths in cases where thallium was administered for ringworm but in doses below the normal (i.e., 8 mgrm. per kilo. body weight). They consider that thallium acetate should not be used in the ordinary routine treatment of ringworm of the scalp for the following reasons: (1) Thallium in itself is a highly toxic substance showing a marked similarity to lead, both in its chemistry and in its toxic symptoms, and the far-reaching effects of the poison are much greater than is generally supposed. (2) It has a definitely selective action on all forms of nervous tissue, and it has been demonstrated that, even in infinitesimal doses, it causes slight degenerative changes in the brain cells of rats. It is therefore most unlikely to leave the human brain entirely unchanged, and it seems impossible to be certain that it does not hinder further brain development. (3) The margin between an epilating and a toxic dose is extremely small and allows for no idiosyncrasies, whereas with X rays the dosage is very accurate, trouble is rare, and if a mishap occurs it is at least local. (4) Ringworm of the scalp is not in itself a fatal disease and, though often troublesome, can usually be cured by other means. It therefore does not seem justifiable to use such a powerful poison in an attempt to cure it a little more quickly. (5) It is quite easy to obtain thallium salts in a state of

## PLATE LXI

### MONILIA INFECTION

(J. M. H. MACLEOD AND G. B. DOWLING)



Extensive monilia infection. *Monilia pinopi* cultivated.

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purity, and there is no especial reason why a solution which has been kept for some time should not be used. The authors do not believe that toxic phenomena were ever due to the use of an old solution.

G. H. Percival<sup>3</sup> has investigated the after-history of seventy-six children who had been treated by thallium for scalp ringworm at from four months to two years previously. By using the weights and heights as standards on which to interpret physical development, and taking into account the results of a general medical examination, he could find no evidence that the continued normal growth and nutrition of the children were adversely influenced or interfered with.

#### **Epidermophytosis.—**

**TREATMENT.**—A. G. Gould and E. K. Carter<sup>4</sup> describe a series of experiments carried out with a view to determining the action of **Salicylic and Benzoic Acids** used in combination (the basis of Whitfield's ointment) on cultures of the fungi most commonly found in interdigital ringworm of the toes. Their observations lead them to conclude that combined salicylic and benzoic acids are strongly fungistatic for three of the common trichophytons of ringworm of the feet and toes. Fungistatic tests indicate that the cultures of *T. interdigitale* used in this study belong to two different strains in respect to their powers of resistance to salicylic and benzoic acids. They produce some evidence to show that the trichophyton species used by them are less resistant to the action of these acids *in vitro* than *in vivo*. They do not consider that this action on fungi is due to the increase in hydrogen-ion concentration, but that the negative ion (derivative of the benzol ring) is the one of importance in bestowing fungistatic properties on salicylic acid. The OH group of the molecule of salicylic acid gives it valuable caustic and coagulant effects on the protoplasm of fungi; these properties are less evident in the action of benzoic acid, which is devoid of this OH group. The fungistatic properties of these acids are a function of the large size of their molecules.

W. L. Gould<sup>5</sup> recommends the use of footbaths of 10 to 15 per cent **Sodium Thiosulphate** in the treatment of epidermophytosis of the feet. He has been successful in clearing up an epidemic in a school by this method alone in about a month.

**Yeast-like Fungi.**—J. M. H. MacLeod<sup>6</sup> and G. B. Dowling<sup>7</sup> have continued their work on monilia and pityrosporon infections which has been reported in previous numbers of the MEDICAL ANNUAL. MacLeod states that he has only been able to show with certainty that two varieties of monilia—*M. albicans* and *M. pinoyi*—are pathogenic in man. He describes a number of lesions which may be produced by these fungi, most of which have been noted in previous communications. Stress is laid on the liability of the flexures, especially those which are very moist, to become infected—for example, the interdigital spaces, the angles of the mouth, the anal and vulval regions, the axillae, and genito-crural regions. One generalized case (*Plate LXXI*) in a girl of 8 years is described, in which lesions were present about the eyelids, nose, mouth, elbows, genito-crural region, flexures of the elbows and knees, feet, hands, and nails. This consisted of inflamed crusted patches, suggesting at first sight eczematous patches which had become secondarily infected with pus organisms. On further observation it was found that the initial lesion was a superficial vesicle or vesico-pustule which on rupturing left a small denuded surface enclosed by a ring of detached epidermis. The lesions increased peripherally and united with others to form confluent patches with an irregular border of undermined epidermis, beyond which isolated vesicles or inflamed scaly macules could here and there be detected. In certain of the older lesions the scaliness so predominated as to simulate ringworm. In

addition to the skin lesions, whitish patches were present in the mouth and vulva, and there was a seropurulent discharge from the vagina. An examination of the scrapings showed the presence of a yeast-like fungus, which on cultivation proved to be *M. pinoyi*. Inoculation experiments were done and artificial lesions were produced similar in type to the natural ones. The case, though somewhat resembling some instances of generalized ringworm, is important as still further widening the field of diagnosis in cases with disseminated eczematous lesions.

Dowling has continued his experiments on the pathogenicity of these fungi, using the two types of monilia mentioned above, and the pityrosporon. From his researches he concludes that these three organisms are at times parasitic to the human skin, though he agrees that the work of Greenbaum and Klauder suggests also that they may be normally saprophytic. Their pathogenicity is generally of a low grade, but they acquire increased virulence in the parasitic phase.

I. Muende<sup>8</sup> has written an exhaustive article on the same subject, summarizing the work done on monilia infection up to the present time. He also summarizes the treatment employed in various types. For buccal cases (thrush) the mouth should be cleansed with **Glycerin of Borax** or a 2 per cent aqueous solution of **Borax and Potassium Chlorate**, followed by painting with a 1 per cent watery solution of **Gentian Violet** (MacLeod). Perlèche can be treated either with an **Ammoniated Mercury Ointment** containing 2 to 5 per cent **Resorcin**, 5 to 10 per cent **Silver Nitrate** lotion, or 2 to 5 per cent **Gentian Violet** in 15 per cent spirit.

Infection of exposed surfaces responds well to disinfection with **Potassium Permanganate**, followed by 3 per cent **Salicylic Acid** and 5 per cent **Benzoic Acid Ointment** (Whitfield's ointment). The more severe cases of interdigital moniliasis (Fabry's 'erosio interdigitalis blastomycetia') can be treated by the application of **Tinct. Iodi**, followed, when dry, by a **Salicylic Acid and Talc Powder**; or by **Curettage**, followed by the application of 5 to 10 per cent **Silver Nitrate** lotion. Castellani's **Fuchsin Paint** is also recommended; it is prepared as follows: Saturated alcoholic solution of basic fuchsin 10 c.c., 5 per cent aqueous carbolic acid solution 100 c.c. Filter and add boric acid 1 gm. After two hours add 5 c.c. of acetone; two hours later add resorcin 10 gm. The paint should be kept in a dark-coloured bottle with glass stopper.

For suppurative *paronychia*, the fingers should be bathed in warm saline solution for a quarter to half an hour and, after drying, a 5 per cent solution of **Silver Nitrate**, **Iodine**, or **Phenol** should be applied beneath the nail fold. A dressing with a very weak solution of iodine (iodine 1 gr., potassium iodide 10 gr., water to 2 oz.) may be of some value.

Monilia infection of the nail-plate is, like similar mycotic infections, very difficult to eradicate and frequently necessitates surgical removal. When this line of treatment is adopted, careful after-treatment of the nail-bed with **Gentian Violet** or **Fuchsin Paint** is indicated to prevent re-infection of the newly growing nail.

D. H. Haler<sup>9</sup> described his investigations of 24 cases of chronic paronychia. The symptoms were those usually seen in the disease: a peculiar raised, red, bolster-like appearance of the posterior nail-fold and a marked separation of the eponychial layer from the nail. Pus formation and lymphangitis did not occur. The affection was usually bilateral and there was no predilection for either hand or any particular digit. Of the 24 cases only 4 were males. An organism indistinguishable from *M. pinoyi* was isolated in each case. For treatment he recommends wet compresses of 4 per cent **Collosol Ichthyol** with the addition of  $\frac{1}{2}$  per cent **Copper Sulphate**. He also quotes Whitfield



as recommending constant wet dressings with a 1-5 lotion of **Monsoi**. Wet-ting of the hands should be avoided.

**Trichophytides and Epidermophytides.**—W. N. Goldsmith<sup>10</sup> records an interesting case of typical erythema multiforme which commenced twelve days after the appearance of a trichophyton infection of the hands. This type of trichophytide has been previously described following deep ringworm infections, but in this case the lesions were of the superficial type. The fungus found was the *T. interdigitale* (Priestly). The eruption cleared up *pari passu* with the tinea lesion.

S. M. Peck<sup>11</sup> calls attention to the association of vesiculo-pustular lesions on the hands with fungous affections of the feet. The association has been noted by previous observers and much work has been done, notably in Bloch's clinic, on the subject; but Peck's work is an important contribution to the subject. Twenty-three new cases are recorded, in all of which fungi could be demonstrated in the lesions on the feet, but in none could they be found in the lesions of the hands, microscopically or culturally. In cases where the patient was aware of the trouble on the feet, the lesions on the hands had appeared some time subsequently. In some cases the hand lesions appeared after mechanical or chemical trauma. After intracutaneous trichophytin injections, in each case, there occurred a positive local reaction demonstrating a state of allergy. In a number of cases reactions were also shown in the primary lesions and herd reactions in the lesions on the hands, as well as certain constitutional disturbances. Generally the lesions on the hands healed only when the primary lesions on the feet were treated. In one case the dysidrotic changes on the hands were accompanied by a generalized eruption of the same character. In one case the fungus was cultured from the circulating blood as well as from the feet.

The author was further able to produce the lesions experimentally by inoculating the feet of a trichophyton-negative person. Thirteen days after inoculation the trichophytin reaction became positive; twenty-four days after inoculation a slight dysidrotic eruption developed on the hands, the lesions being negative for fungi. A re-infection of the same patient was produced after spontaneous healing of the first infection had occurred. This was followed two weeks later by a typical dysidrotic eruption on the hands.

The author concludes that the evidence he has produced strongly supports the view that these dysidrotic lesions of the hands are epidermophytides, produced by the haematogenous transport of living fungi from the primary lesions of the feet.

REFERENCES.—<sup>1</sup>*Brit. Med. Jour.*, 1931, i, 791; <sup>2</sup>*Lancet*, 1930, ii, 1340; <sup>3</sup>*Brit. Med. Jour.*, 1931, i, 575; <sup>4</sup>*Arch. of Dermatol. and Syph.*, 1930, Aug., 225; <sup>5</sup>*Jour. Amer. Med. Assoc.*, 1931, April 18, 1300; <sup>6</sup>*Brit. Jour. Dermatol. and Syph.*, 1930, Dec., 549; <sup>7</sup>*Ibid.*, 562; <sup>8</sup>*Ibid.*, 1931, Jan., 3; <sup>9</sup>*Ibid.*, July, 343; <sup>10</sup>*Ibid.*, March, 121; <sup>11</sup>*Arch. of Dermatol. and Syph.*, 1930, July, 40.

## SKIN, STREPTOCOCCAL INFECTIONS OF.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

### Erysipelas.—

**TREATMENT.**—W. H. Ude and E. S. Platou<sup>1</sup> have examined the results of treatment in over 400 hospitalized cases of erysipelas. The cases were treated by local applications of **Magnesium Sulphate** and **Glycerin Pack**, by **X Rays**, or by **Ultra-violet Irradiation**. A few were also treated by **Anti-toxin** alone; antitoxin plus X rays; or antitoxin plus ultra-violet irradiation. Their results appear to show that cases treated by irradiation, either X rays or ultra-violet light, give better results, i.e., shorter period of symptoms, than the other methods, the balance being slightly in favour of ultra-violet

irradiation. For this latter treatment they use the quartz mercury vapour lamp and give a dose sufficient to produce a strong erythema without blistering. The dose is only repeated if there is extension of the disease. The cases treated with X rays were given a sub-erythema dose through 2 mm. of aluminium.

R. H. Jamieson and F. Hernaman-Johnson<sup>2</sup> report three cases of erysipelas which yielded rapidly to **X-ray Therapy**.

W. T. Benson<sup>3</sup> reports his observations of 235 carefully controlled acute cases of erysipelas treated with **Vaccines**. The following vaccines were tried: stock and autogenous streptococcal vaccines, and mixed strepto- and staphylococcal vaccines. He concludes that this treatment does not (1) shorten the duration of the attack, (2) prevent extensive spread of the inflammatory process, (3) lessen the incidence of common complications such as abscesses and cellulitis, (4) diminish the occurrence of relapses, (5) prevent recurrences, or (6) have any appreciable effect in diminishing the mortality of the disease.

#### **Impetigo Contagiosa.**—

**TREATMENT.**—W. J. O'Donovan<sup>4</sup> recommends the following treatment for impetigo contagiosa: It is advisable for cases to be kept in a room at constant temperature. If the body is infected cotton should be worn next to the skin, and changed and boiled daily. Ointments are liable to spread the disease, and mercurial ointments of any potency are harmful to the inflamed skin and may cause acute exacerbations. The lesions should be bathed in hot water or starch-poulticed to soften the crusts, then swabbed with a very weak **Peroxide of Hydrogen** solution and dusted with a **Zinc Oxide and Calomel** dusting powder. Excellent results can be obtained by spraying the cleaned sites twice daily with a solution composed of equal parts of 2 per cent **Malachite-green** in 80 per cent alcohol, and 2 per cent **Mercuric Chloride** in 80 per cent alcohol. If the exudation is not too copious, retentive lint and gauze dressings are better avoided. Chronic cases of impetigo can be cleaned by daily mopping with a **Silver Nitrate** solution. Three or four applications of erythematous doses of **Ultra-violet Light** in the course of a week or ten days will usually cure an impetigo contagiosa at any stage.

**REFERENCES.**—<sup>1</sup>*Jour. Amer. Med. Assoc.* 1930, July 5, 1; <sup>2</sup>*Brit. Med. Jour.* 1931, Jan. 10, 57; <sup>3</sup>*Lancet*, 1930, ii, 1286; <sup>4</sup>*Ibid.* 1931, i, 461.

#### **SKIN-GRAFTS.**

*Sir W. I. de C. Wheeler, F.R.C.S.I.*

The type of skin-graft used by the reviewer to cover a defect in an unexposed portion of the body such as the foot, thigh, back, or abdomen, is the multiple full-thickness graft about  $\frac{1}{4}$  in. in diameter. The site from which the graft is to be taken is locally anaesthetized with percaïne or novocain. A bayonet-pointed needle is made to pierce the surface of the skin, and the latter is raised by the needle and shaved off the underlying subcutaneous tissue with a sharp knife. The graft is then lifted on the point of the needle to the site to be grafted. This process is repeated until almost the entire surface is covered. This is the most simple of all the procedures designed for skin-grafting. These small grafts are always successful.

Full-thickness skin grafts the exact size of the defect are used in exposed positions and are fixed in position by interrupted fine silkworm-gut sutures. Whatever graft is used, either perforated oil silk or the perforated celluloid material recommended by Almroth Wright during the War to cover wounds is laid upon the grafted area, over which is placed a light dressing of gauze and wool. Next comes a flattened marine sponge, and, lastly, the dressings are secured in position under pressure by an elastic adhesive bandage.

H. L. Updegraff<sup>1</sup> draws attention to the advantage of removing the granulations from the area to be covered. Hæmorrhage is controlled by pressure

while the graft is being cut. Very large full-thickness grafts may be contemplated with assurance if first elevated on three sides and resewn for a period of ten days with proper drainage. This writer states that the general acceptance of the pressure dressing has given an easily applied, more or less standardized procedure. Correct pressure dressings are difficult unless satisfactory immobilization can be obtained. Thus the use of plaster-of-Paris, splints, sand-bags, etc., must not be forgotten. The author summarizes his paper as follows: (1) Grafts are parasitic for the first four to five days of implantation. (2) Type of graft to be used depends on thickness and coloration desired. (3) Preparation of donor area and graft site are simple cleanliness and control of hemorrhage. (4) Marine sponge pressure dressing is the best all-round measure. (5) Infected grafts should be dressed daily or oftener. **Dextrose and Insulin** administration are of benefit. (6) Sodium amytal, intratracheal and rectal anaesthesia in selected cases offer a medium, allowing a greater latitude for work. (7) The possibility of a single graft so cut as to embody a thin edge and thick centre is to be remembered.

REFERENCE.—<sup>1</sup>*Calif. and Western Med.* 1930, Sept., 679.

**SKULL, FRACTURES OF.** (*See* EAR, AFFECTIONS OF; EPILEPSY, TRAUMATIC; HEAD INJURIES.)

**SLEEPING SICKNESS.** (*See* TRYPANOSOMIASIS)

### SMALL-POX.

*J. D. Rolleston, M.D., F.R.C.P.*

**EPIDEMIOLOGY.**—According to a recent Ministry of Health Report,<sup>1</sup> since 1922 an exceptionally large number of small-pox cases have been reported annually in England and Wales. Since 1926 they have ranged between 10,000 and 15,000 per annum, in contrast with the period 1911–22 in which the annual incidence varied between 7 and 315 cases. The fatality-rate on the other hand has been very trivial, ranging from 7 to 53 cases annually, the rate per 1000 cases being between 1.68 and 4.27 since 1923.

F. T. Doleman<sup>2</sup> illustrates the low infectivity of the minor small-pox prevalent in Leicestershire by the fact that in several instances single cases occurred in large unvaccinated households, the remainder of the family exposed having escaped. According to him, the most and possibly only infectious period of minor small-pox to-day is during the development of the rash. The commonest modes of infection in his experience were occupation of the same bedroom and courting by young couples. No case of propagation by fomites was observed.

W. Hanna,<sup>3</sup> deputy Medical Officer of Health of the City and Port of Liverpool, states that the Merseyside area, which had been free from small-pox in epidemic form for a considerable time, had recently had some cases of a virulent type, including two fatal cases of hæmorrhagic small-pox as well as very severe confluent forms which recovered. He points out that owing to its extensive maritime trade this country is always liable to the importation of virulent forms of small-pox, and on such occasions prompt vaccination and revaccination of contacts and their supervision for the usual period with house-to-house visitation should be carried out by the Medical Officer of Health.

Guilhaud and X. Leclainche<sup>4</sup> emphasize the heavy incidence and mortality of small-pox in France in 1926 and 1927 (565 cases in 1926 and 313 in 1927 with a mortality ranging from 20.18 to 38.46 per cent for the Paris district). They attribute this outbreak of small-pox in a country where vaccination is compulsory to the fact that the law is not being strictly enforced, especially as regards revaccination, and to the too summary character of the inspection

of immigrants, especially from North America. Owing, however, to the comparatively small number of susceptible persons and the immediate enforcement of strict measures, the epidemic foci remain localized and for the most part are soon stamped out.

According to P. Hermant,<sup>5</sup> small-pox is to-day tending to disappear in the French Colonies, where it was formerly so rampant. Its distribution in 1928 was as follows: French West Africa 1382 cases, Mandated African territories 162, French Equatorial Africa 21, Indian Ocean group 1600, Indo-China group 1433, Oceanic and American groups 0; amounting to a total of 4618 cases with 1699 deaths. No fewer than 8,898,627 vaccinations were carried out in 1928, but small-pox is still kept alive by a number of ignorant and refractory persons refusing to submit to vaccination.

**SYMPTOMS AND COMPLICATIONS.**—C. F. Eikenbary and J. F. Lecocq<sup>6</sup> draw attention to the *non-suppurative osteomyelitis* described by W. L. and C. P. Brown (see MEDICAL ANNUAL, 1925, p. 409) and others which may occur in small-pox. The effect of the small-pox virus which is apparently situated in the epiphysal lines of the long bones is to produce an aseptic necrosis which chiefly affects the growing cartilage cells of the epiphysal lines and causes premature closure. The diagnosis of osteomyelitis is often not made until after the acute attack, when deformities caused by inequality of the growth of the bones appear. The deformities do not occur in adults because bone growth has occurred and the small-pox virus apparently affects only the epiphysal lines of bone. (See also OSTEOMYELITIS.)

A. G. Troup and E. W. Hurst<sup>7</sup> report a fatal case of *disseminated encephalomyelitis* following discrete small-pox in an unvaccinated man aged 63. The onset of the nervous symptoms took place on the sixteenth day of disease and death occurred six days later. The post-mortem changes in the brain and cord were indistinguishable from those following vaccination and measles.

The writers illustrate the rarity of the nervous complications of small-pox by quoting the reviewer's statement that among the records of 10,000 patients in the London epidemic of 1901-2 there were only 25 examples of nervous complications.

**REFERENCES.**—<sup>1</sup>*Rep. Publ. Health and Med. Subj.* 1931, No. 62; <sup>2</sup>*Brit. Med. Jour.* 1930, ii, 323; <sup>3</sup>*Lancet*, 1930, ii, 990; <sup>4</sup>*Bull. off. internat. d'Hyg. publ.* 1930, xxii, 1666; <sup>5</sup>*Ibid.* 1710; <sup>6</sup>*Jour. Amer. Med. Assoc.* 1931, xvi, 585; <sup>7</sup>*Lancet*, 1930, i, 566.

## SNAKE POISONING.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

Investigations of the poisonous snakes of Australia have been recorded by N. H. Fairley and C. H. Kellaway<sup>1</sup> in continuation of the work done many years ago by C. J. Martin. The first-named author deals with the present position of the subject, the dentition and biting mechanism, and the venom-yields of Australian snakes. They number over seventy, the most important being the death adder, the tiger snake, the copper-head, the brown snake, and the black snake. The deaths recorded in the Commonwealth from venomous bites and stings from 1910-26 numbered 244, mostly in Queensland and New South Wales, the death adder being the most dangerous and the brown snake the least lethal, and the yield of venom was found to increase with the distance separating the fangs, which can be estimated clinically by the distance between the skin punctures. A new method of studying ophidian dentition by casts of the bites is described. Experiments on sheep bitten by the tiger snake with immediate ligature combined with incision and the application of permanganate solution failed to save their lives, and excision of the bitten area was only effective if a ligature was applied within one minute of the bite, as a lethal dose of the tiger snake is absorbed within two minutes. The preparation of

an **Antivenine** is therefore advocated, together with such prophylactic measures as the use of leggings and putties in snake-infested countries.

C. H. Kellaway deals with the venom of the tiger snake given subcutaneously to avoid the thrombosis following intravenous injection, and he found its action to be neurotoxic with muscular paresis, and that sublethal doses in recovering animals might be followed by blindness. The venom of the copper-head snake had not apparently been studied previously, but like other Australian snakes it kills by its neurotoxic action supplemented by hæmorrhages and hæmolysis; it does not, however, cause thrombosis when injected intravenously. The lethal dose for man is probably between 1.4 and 0.02 mgrm. per kilo, and it is suggested that Australian snake venoms have a general stimulant action on body secretion which may help to eliminate the poison.

M. Smith and E. Hindle<sup>2</sup> report on the lethal action of three previously uninvestigated venoms. That of the sea-snake *Laticauda colubrine*, of Polynesia, proved toxic to mice and to eels, on which they live, but the amount of venom ejected is not likely to be fatal to man. Two pit vipers, *Trimeresurus sumatranus* and *T. wagleri*, have not proved fatal to man, but their venom killed mice, with symptoms suggestive of a neurotoxin.

REFERENCES.—<sup>1</sup>*Med. Jour. of Australia*, 1929, March 9, 16, 23, and June 8; <sup>2</sup>*Trans Roy. Soc. Trop. Med. and Hyg.* 1931, Aug. 8, 115.

## SPINE, CURVATURE OF. (See SCOLIOSIS.)

### SPINE, INJURIES OF.

E. W. Hey Groves, M.S., F.R.C.S.

S. J. H. Griffiths, F.R.C.S.

Injuries of the spinal cord may occur without dislocations or fractures of the spinal column. One of the commonest of this type of injury is hæmatomyelia, the characteristic signs of which are analgesia, with loss of temperature sense in the distribution of the affected area. This is due to the fact that hæmorrhages are most frequently central and so affect the pain and temperature fibres as they cross from the homolateral to the contralateral side of the cord. Julian Taylor,<sup>1</sup> in discussing injuries of the spine, divides those of the vertebral column into dislocations and fractures, the majority of the former being complicated by the latter. The physical examination will often show the nature of the injury, but radiography is a necessity in every case of spinal injury, and without radiological help many lesions of the spinal column would remain undiagnosed. Taylor expresses the opinion that the repair of spinal fractures is rapid and consolidation is sufficient for weight bearing in about eight weeks.

**Compression Fractures of the Spine.**—Although it was in 1895 that Kümmel first drew attention to the serious late results in these cases, it is only in the last few years that the disease bearing his name has received proper attention. Kümmel's disease consists essentially of the development of a painful back with a wedge-shaped deformity of a vertebra following trauma. The trauma may not be severe or the lesion excite much clinical attention at the time, but expert radiography would have revealed a compression fracture of the body of one of the vertebræ. R. Leriche<sup>2</sup> expresses the opinion that the condition is due to a post-traumatic osteoporosis from hyperæmia. Hyperæmia is caused by constant internal traumata sustained by a spine which has lost its equilibrium, and therefore the prevention of Kümmel's disease following a compression fracture is sought by placing that portion of the spine which has been injured at rest so that it cannot be bent. For this, immobilization in bed is not sufficient, and a bone-grafting operation to arthrodesis the affected portion of the spine should be

done at once in every case. Leriche has performed this operation five times : in four the results were excellent, and the fifth is too recent to warrant an opinion.

F. Christopher<sup>3</sup> gives the late results in conservative treatment. His method consists in immobilizing the spine in a plaster case in a position of hyper-extension for six to eight weeks, and this is followed by the wearing of a Taylor's spinal brace for about five months. He analyses nine cases. The average age was 43.7 years ; the average period of recumbency was 54.6 days ; the average time of wearing the back brace was 136 days ; and the average time of follow-up report was 27.5 months. The first lumbar vertebra was involved three times, the second lumbar and twelfth dorsal each twice, and the fourth lumbar and seventh dorsal each once. In eight cases there is no definite report of pain in the back at the site of the fracture. In the ninth case "no pain except a twinge after a sudden twist" was reported. Seven patients are doing the same work as before the accident, and of the two who are not doing the same work one is prevented from doing so by an amputation of a leg. The seventh patient had apparently the most prolonged convalescence, for he spent the best part of a year in bed. The results of conservative measures may be summed up as : Excellent results 55.5 per cent, good results 33.3 per cent, and fair results 11.1 per cent.

REFERENCES.—<sup>1</sup>*Practitioner*, 1931, July, 84 ; <sup>2</sup>*Lyon chir.* 1930, Jan.-Feb., 27 ; <sup>3</sup>*Amer. Jour. Surg.* 1930, Sept., 424.

#### **SPIROCHETOSIS ICTEROHÆMORRHAGICA.** (See JAUNDICE, INFECTIVE.)

#### **SPLEEN, SURGERY OF.** (See also X-RAY DIAGNOSIS.)

*A. Rendle Short, M.D., F.R.C.S.*

Social conditions in America to-day afford surgeons in the big towns opportunities of experience with injuries which are happily uncommon on this side of the Atlantic. L. Dretzka,<sup>1</sup> of Detroit, reports on 27 cases of injury of the spleen, of which 14 were due to gunshot wounds and 2 to stab-wounds. His main points are the importance of treating surgical shock, if present, before opening the abdomen, and the value in most of the gunshot and stab-wound cases of simple suture or tampon. If the lesion involves the hilum, or if the spleen is extensively lacerated, it should be removed.

REFERENCE.—<sup>1</sup>*Surg. Gynecol. and Obst.* 1930, Aug., 258.

#### **SPLENIC ANÆMIA.** (See ANÆMIA, SPLENIC ; SYPHILIS.)

#### **SPRUE.**

*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

The pathological anatomy of the intestinal tract in sprue is described and illustrated by Th. E. H. Thaysen<sup>1</sup> from sections made in a fatal case in China. After a review of the variable changes previously reported, he concludes that such changes as desquamation, degeneration, and atrophy of the intestinal mucous membrane of earlier workers are only post-mortem changes, that intestinal ulcers are so rare in sprue as to have nothing to do with the causation of the disease, and that enteritis or entero-colitis is also so inconstant as to be only a secondary phenomenon. J. D. Tyner<sup>2</sup> reports on the Arneth count in sprue, which he found to be about the normal, or 62.1, in 17 out of 20 cases, against 32.45 in 10 cases of pernicious anæmia ; it may thus be of diagnostic help in differentiating between the two conditions. S. K. Vaidya<sup>3</sup> records 119 blood examinations in sprue cases in Bombay, and he agrees with Elders that both pernicious anæmia and sprue are deficiency diseases, with resulting

marked gastro-intestinal symptoms in some cases, and the acuteness depends on the absence of bone-marrow response. **Arsenic**, with **Hydrochloric Acid** and **Pepsin**, with or without **Liver Extract**, is very valuable in treatment. E. Baumgartner and C. H. Jewett<sup>4</sup> report on 36 cases of sprue, in 16 of which the blood picture was similar to that of pernicious anæmia, but all but four were differentiated from the latter condition by the presence of free hydrochloric acid in the stomach, a low blood-calcium, and a large dilated colon, which they regard as characteristic of sprue, while it is absent in pernicious anæmia. Liver is valuable for anæmia. P. Manson-Bahr and H. Willoughby<sup>5</sup> have analysed on the usual lines 200 cases of sprue seen in London in ten years; they state that they have come to the following theoretical conclusions. Sprue is a disease *sui generis* affecting mainly Europeans living near natives in an endemic area, from whom the disease may be contracted, as they also suffer from it to some extent. The authors think the disease has a definite incubation period, which may not exceed three months, but the infection may be latent for years, and that it is due to an unknown virus affecting the intestinal tract and involving digestion and absorption. This may result in anæmia, which in severe cases may be amenable to blood transfusion, and cure depends on a nutritious and easily assimilable diet, with the addition of protein and liver—nearly all generally-held views. A. Bassler and J. R. Lutz<sup>6</sup> also advocate the liver treatment, combined with a change to a cold climate and **Transduodenal Lavage with Hypertonic Saline**, consisting of 9 grm. each of sodium sulphate and sodium chloride in 1000 c.c. of water at 104° F., before bedtime to clear out fermented food residue, 500 c.c. being the usual quantity given. They think the digestive symptoms are controlled more quickly by this plan.

REFERENCES.—<sup>1</sup>*Trans. Roy. Soc. Trop. Med. and Hyg.* 1931, March 13, 539; 1930, Sept. 15, 539; <sup>2</sup>*Amer. Jour. Trop. Med.* 1930, Nov., 435; <sup>3</sup>*Jour. Trop. Med. and Hyg.* 1930, Sept. 15, 265; <sup>4</sup>*Arch. of Internal Med.* 1930, Oct., 597; <sup>5</sup>*Quart. Jour. Med.* 1930, July, 411; <sup>6</sup>*Jour. Amer. Med. Assoc.* 1930, Dec. 27, 1961.

## SQUINT.

W. S. Duke-Elder, M.D., F.R.C.S.

The subject of squint has come into prominence during the past year by the development of new instruments for the visual training of squinting eyes, such as the cheiroscope of E. E. Maddox<sup>1</sup>, and others based on the amblyoscope of Worth, such as the synoptoscope and the synoptophore, and the introduction of clinics for orthoptic treatment in the large special hospitals in London and elsewhere. It must be admitted that during the years which have passed too little attention has been paid to the essential feature in most squinting eyes—the vision—and too much to the purely cosmetic aspect and its mechanical rectification by operation. A squint can only be said to be cured when the end-result is good vision and full binocular co-operation in two eyes which are in perfect alinement; and to obtain this end, the methods which have hitherto been adopted in treatment in too many cases have been singularly unsuited—a policy of inaction initially in the hope that the child “will grow out of it”, rectification of any refractive error by glasses when the child is “old enough to wear them”, and the correction of the deformity (which frequently had to be repeated) when the child was “old enough to be operated upon without a general anæsthetic”. According to recent views which are rapidly developing, every one of these postulates is wrong. The opinion widely held not only among the laity but also among practitioners of medicine that a child will outgrow a squint is quite fallacious. The essential point in the treatment of squint is the restoration of full function to the eyes; the rectification of the deformity follows as a necessary corollary of this, for once stereoscopic vision has been established, the possibility of relapse is remote. Treatment should be instituted at the very first moment at which

a squint, or a temporary intermittent tendency to squint, is noticed—neglecting, of course, the physiological inco-ordination of the eyes in the first months of life before reflex paths have been facilitated. Glasses alone should never be relied upon to correct the visual defect, and (although this last point is disputed), depending upon the response to orthoptic visual training, the earlier a corrective operation is undertaken, the better.

The first essential in the rational treatment of squint is the attainment of good vision in the two eyes, and the most practicable method to attain this is by the occlusion of the stronger eye. In general terms the younger the patient, the more readily does a squinting eye respond to the function thus forced upon it, and occlusion can be carried out at any age—if necessary in an infant, and very readily in a child who is difficult to control by covering the eye with opaque black material, such as silk, stuck round the orbit with mastic solution. Once both eyes are possessed of good vision—and it is possible to excite the interest of very young children sufficiently to gain enough information on this point—the vision of the weaker eye should be maintained by periodical occlusion until such time as it is possible to make both eyes work together by orthoptic treatment. As soon as is possible any refractive error of magnitude should be corrected with glasses. Although our knowledge of the etiology of squint is meagre and rests mainly on hypotheses, few will deny that one factor of considerable importance is an error of refraction, and it is almost certainly true that if this is eliminated, one of the influences which tend to accentuate and perpetuate the condition is removed. It is easy—provided the usual opposition on the part of the parents is successfully overcome—to put a child of a year old (or even less) into glasses, which should be of non-splintering glass, carefully constructed, especially with regard to their fitting on the nose, and should be attached by elastic round the head.

**Orthoptic Treatment** consists in the development and facilitation of the central nervous mechanism subserving binocular vision with a view to getting both eyes to work in concert, and thus incidentally bringing their visual axes into alinement when this is mechanically possible. This should be started as soon as the child's interest can be excited, and with the improved and extremely adaptable amblyoscopes which are now available, such as the synoptophore, this is possible in an infinite variety of ways. Moreover, the cheiroscope of Maddox brings a wider range of reflexes into operation. In this instrument the picture carrier of a stereoscope is replaced by a horizontal surface on which the child can play and draw, using the hand to demonstrate or develop the act of fusion of the image or object controlled by the squinting eye with the image or object seen independently by the more normally seeing eye. A mirror system, which may be supplemented by prisms, is used to obtain the approximate adjustment necessary in the case of convergent squint. Games so simple can be played upon the instrument that very young children can readily be made sufficiently interested to co-operate in their treatment, and in this way the hand of the squinter is employed to educate his squinting eye, initiating the natural processes of infancy in which the hand and eye mutually perfect their training by trial and error. While this training is going on, as soon as macular vision has been elicited in both eyes, it seems that C. H. Sattler's<sup>2</sup> plan of combining prisms in the spectacles in addition to a correction of the refractive error is sound. It is possible to wear prisms as high as 20° in each eye. In this way during the period when training is taking place the maculae are each being directed upon the same point in space and their co-operation is thus encouraged. If this is not done, apart from the relatively short time during which actual exercises are being undertaken, the macular



vision of the squinting eye is being reflexly inhibited and the ultimate success of the treatment is being jeopardized.

It is probable that as soon as a desire for fusion has been initiated, operative measures should be contemplated. If the squint is small and the response to orthoptic treatment good, alinement of the visual axes may result without surgical interference. But if the mechanical deformity is great, and, apart from economical and psychological considerations, if the time presumably necessary to attain correct alinement by visual training alone is likely to be so prolonged as to jeopardize the eventual efficiency of binocular vision, the squint should (in the writer's opinion) be operated upon regardless of the youthfulness of the patient. With the eyes approximately in alinement subsequent training of binocular vision is greatly facilitated, and if a well-developed capacity for fusion is initiated and the habit of binocular vision confirmed by orthoptic exercises, and maintained by subsequent courses of treatment until after the age of 12 or 14, the risk of deviation at a later date is small. It is much less than the risk of recurrence entailed by sacrificing the possibility of developing a well-established binocular sense while the central nervous system is still plastic, by postponing operation until late adolescence.

With regard to operative technique, little new has emerged within the period under review. It is undoubtedly true that the haphazard operation of tenotomy, once so popular in this country, is gradually falling into disfavour and deservedly so, to be replaced by the more exact and definite procedure of **Recession**, whereby the preponderating muscle is not only detached but is re-inserted at the point desired. A fact, however, which may not be sufficiently realized is the ease with which a vertical deviation can be introduced by allowing the new insertion to depart from the horizontal. When the deformity is large (varying with the conditions in particular cases, but averaging over 15°) a recession should be supplemented by an advancement of the weaker muscle; and when the deformity is very large, the functional result is probably better if the correction is distributed between the two eyes rather than if heroic measures are attempted on the one. A continuous series of minor modifications or of new devices in technique are published, but in the majority of cases the advantages of these are small or questionable. In the reviewer's experience the method which received wide publicity a year or two ago of accurate mathematical measurement of recession or advancement, displacing the insertion of the muscle by a calculated number of millimetres for each angle of correction desired, is unreliable. The rule of 1 mm. of shortening for each 5° of deviation rarely holds good, for the results vary with the state of the muscle operated upon, the degree of development of its opponent, and on the state of co-ordination of all the ocular muscles; they also vary if the opposing muscle is interfered with surgically.

**Tucking Operations**, wherein a muscle is shortened by inserting a tuck into its tendon, folding it upon itself, and suturing it in this position, have their advocates as an alternative to advancement. These are most easily performed by special tucking instruments which pick up the muscle in a fold and retain it in this position while the sutures are tied. Such instruments to help in the necessary manipulations have been used for some time, but new and useful models have been described during the past year by M. E. Smukler<sup>3</sup> and by F. E. Burch and H. W. Grant.<sup>4</sup> By temporarily accentuating the degree of tucking at the time of operation and *maintaining the opposing muscle in a state of extreme tension* for three minutes, Smukler paralyzes this latter muscle for a period of time sufficient to allow firm healing. There is a considerable amount to be said for this device, for it tends to prevent any post-operative stretching of new insertions; but its adoption necessitates a general

anæsthetic in all cases in which it is undertaken, on account of the pain involved in the stretching. The advantages of an *auxiliary suture* are stressed by A. L. Brown.<sup>5</sup> By this device two silk sutures are inserted through the conjunctiva above and below the muscle concerned, and are each passed through the tendon at two points about 8 mm. apart, to reappear through the conjunctiva beside the point of entry. Here they are tied loosely on the outside. When such sutures are pulled taut they approximate the two points of the tendon so that a large tuck is formed; this can be done a week after operation if it is found that the deformity has not been sufficiently corrected. If, however, the added help from the sutures is not needed, they can be easily removed. G. Salvati<sup>6</sup> advocated a completely new departure by paralyzing the preponderating muscle by an **Injection of Alcohol** as a means of restoring alinement of the eyes, and published two not very conclusive photographs illustrating the results. The reviewer has no personal experience of the method, but E. C. Ellett<sup>7</sup> injected a girl 23 years of age in the manner indicated; pain and chemosis were great, but the result was practically nil, and the orthodox operation had to be resorted to at a later date.

REFERENCES.—<sup>1</sup>*Proc. Roy. Soc. Med. (Ophthalm. Sect.)* 1929, Nov. 6; *Amer. Jour. Ophthalmol.* 1930, xiii, 279; <sup>2</sup>*Klin. Monats. f. Augenheilk.* 1930, lxxxiv, 313; <sup>3</sup>*Amer. Jour. Ophthalmol.* 1931, xiv, 808; <sup>4</sup>*Ibid.* 483; <sup>5</sup>*Ibid.* 595; <sup>6</sup>*Ann. d'Oculist.* 1930, clxvii, 229; <sup>7</sup>*Amer. Jour. Ophthalmol.* 1930, xiii, 1095.

### STAPHYLOCOCCUS INFECTIONS. J. D. Rolleston, M.D., F.R.C.P.

SYMPTOMS.—P. S. Lowenstein<sup>1</sup> illustrates the gravity of *staphylococcus septicæmia* by the fact that out of 57 recently reported cases 35 died—a mortality of 61.4 per cent. The prognosis is grave owing to the severe constitutional symptoms and the formation of multiple metastatic abscesses. The outlook is also more serious if the focus cannot be removed or sterilized.

TREATMENT.—Lowenstein<sup>1</sup> states that although the value of **Staphylococcus Antitoxin** is still doubtful, it should be used in large doses intravenously and intramuscularly and, if indicated, intraspinally in *staphylococcus septicæmia*. In chronic cases a **Staphylococcus Vaccine** is sometimes of value. A case of *Staphylococcus albus* septicæmia successfully treated by autogenous vaccine is reported by L. Bivings.<sup>2</sup>

REFERENCES.—<sup>1</sup>*Amer. Jour. Med. Sci.* 1931, clxxxi, 196; <sup>2</sup>*Amer. Jour. Dis. Child.* 1930, xl, 1262.

### STATUS LYMPHATICUS. (See THYMUS IN CHILDREN.)

### STERILITY IN THE MALE. Kenneth Walker, O.B.E., F.R.C.S.

More and more attention is being paid in medical literature to the subject of sterility in the male. Numerous articles have appeared on this topic, especially in the medical journals of America. In general these emphasize the fact that more often than not a childless marriage is the result of the action not of one but of several factors that are hostile to conception. For these multiple causes of childlessness the husband must bear his share of responsibility. S. R. Meaker<sup>1</sup> repeatedly emphasizes the likelihood of the husband's being partly to blame for the absence of children, and gives a working classification of causes of sterility in both the female and the male. In it he draws attention to the frequency of relative sterility—that is to say, of the existence of married couples in which neither party shows any conspicuous pathological condition and yet they remain childless. Sometimes it has happened that the members of such a pair, after separating and re-marrying, have both proved fertile with their new mates. To explain this he revives the old idea of incompatibility, an idea that formerly was commonly held in stockyard and kennel

circles. That there are scientific grounds for holding such a theory of incompatibility is shown by the experiments of Cuénot, Castle, and Little on the breeding of yellow mice. These would appear to show that there are certain hereditary qualities capable of transmission according to Mendel's law which are in their very nature inimical to the embryo that carries them. Whether the same may occur in the case of a human being is not proven, but it is possible that some cases of childlessness in which nothing wrong can be found in either husband or wife may be explained in this way. At any rate it is certain that some cases of childlessness are due not to a failure on the part of the wife to conceive but to the occurrence of repeated early miscarriages.

A paper by D. Macomber and M. B. Saunders<sup>2</sup> lays stress on the importance of carrying out a spermatozoon count as a routine procedure in the estimation of male fertility. According to the authors the semen of a healthy fertile man contains about a hundred million spermatozoa per cubic centimetre. In their experience the lowest figure compatible with fertility is in the neighbourhood of sixty million. If these observations are corroborated by other workers, a spermatozoon count should prove a useful means of estimating the fertility of any husband and also of gauging the results of any method of treatment.

TREATMENT.—Turning to methods of treatment, no great advances are to be recorded. All authors, and especially K. Walker,<sup>3</sup> have laid stress on the close relationship that exists between fertility and general health. In veterinary practice it is customary to turn an infertile animal out to grass, and were the same methods possible amongst human beings it is probable that the fertility of many a sedentary worker would be greatly enhanced. Diet would also seem to be of importance, although the discovery of vitamin E has not apparently yet thrown much light on the problem of human sterility.

The most important advance in treatment is undoubtedly that recorded by F. R. Hagner.<sup>4</sup> His paper deals with the operation of **Vaso-epididymostomy**, first suggested as a means of overcoming an occlusion in the epididymal canal by E. Martin, of Philadelphia. It has, of course, long been recognized that azoospermia, due to cicatrization following epididymitis, is one of the commonest causes of absolute sterility. Unfortunately Martin's operation of vaso-epididymostomy, designed to short-circuit the blockage, although theoretically sound, proved practically a failure owing to a recurrence due to cicatrization around the area of operation during the process of healing. As a result most surgeons had abandoned it as a useless procedure. Hagner, however, is able to report 19 successes out of 31 cases operated on, a success being taken as the reappearance of spermatozoa in the semen from which they had been previously absent. It must be assumed that this high percentage of success is due to the minor alterations in technique for which he has been responsible. Hagner always uses fine silver as a suture material for the anastomosis, and also makes certain that spermatozoa are present in the part of the epididymis selected for the implantation of the vas by making a microscopic examination of secretion taken from that area. He states that it may be necessary to wait some months for the reappearance of spermatozoa in the semen, and that no case need be written off as a failure until a year has elapsed since the operation. His results are most gratifying, and the fact that 12 out of the 19 successful cases subsequently became fathers holds out the hope that by surgical methods it may in the future be possible to cure the majority of those who suffer from this common form of sterility.

REFERENCES.—<sup>1</sup>*Jour. Amer. Med. Assoc.* 1929, Jan. 14; <sup>2</sup>*New Eng. Jour. Med.* 1929, May 9, 981; <sup>3</sup>*Male Disorders of Sex*, 1930; <sup>4</sup>*Sury. Gynecol. and Obst.* 1931, Feb., 330.

**STOMACH, SURGERY OF.** (*See also* GASTRIC ULCER, PERFORATED; GASTRODUODENAL ULCER.) *A. Rendle Short, M.D., F.R.C.S.*

**Acute Atonic Dilatation of the Stomach.**—Several writers discuss this subject. M. Petitpierre,<sup>1</sup> of Basle, points out that though usually it follows abdominal surgery, it may occur in pneumonia and other febrile conditions. If lavage and postural treatment fail, it is best to open both the stomach and the jejunum, the former for drainage and the latter for feeding. Ploos van Amstel<sup>2</sup> describes two cases following a blow on the abdomen. L. R. Dragstedt, M. L. Montgomery, J. C. Ellis, and W. B. Matthews,<sup>3</sup> of Chicago, do not accept the theory that it is due to obstruction of the duodenum by the mesenteric vessels; they believe that there is a primary atony, which leads to failure to pass on fluids to the intestine where they can be absorbed. The atony appears to be due to reflex inhibition of the musculature of the stomach, by way of the vagus and splanchnic nerves.

**The Duodenal Tube.**—M. Flesch-Thebesius<sup>4, 5</sup> speaks favourably of the use of the tube after gastric resections. It is allowed to find its way into the jejunum, and facilitates early feeding. The Reyfuss tube is greatly used at Finney's clinic for the immediate after-treatment of stomach-operation cases, and R. Stuebner<sup>6</sup> has invented a metal connection by means of which the Reyfuss tube passed from the mouth can be brought out through the nose instead, by passing a catheter through the nose with the metal connection on the end. If it is to stay for several days, the tube is more comfortable in the nose than passing through the mouth.

M. Einhorn<sup>7</sup> finds that it is possible to feed up patients with pyloric stenosis if the tube can be got to pass, and it may lead to such dilatation that permanent benefit is obtained.

**Pyloric Hypertrophy in Adults.**—C. C. McClure,<sup>8</sup> of Cleveland, describes five cases of this rare condition, not due to either ulcer or cancer. Some of them are no doubt survivals of an infantile pyloric hypertrophy. It is distinguished from spasm, in that the narrowing is not relieved by atropine. Gastro-enterostomy is required.

**Carcinoma of the Stomach.**—

**DIAGNOSIS.**—H. J. Patterson<sup>9</sup> writes on the early diagnosis, stressing the importance of anorexia, gastric discomfort, failure of strength, and slight anæmia. The onset is often sudden, but in 40 per cent of the cases there is a long dyspeptic history. Chronic gastritis gives similar symptoms, but there is little anæmia or loss of strength, and morning vomiting is common.

Three long important articles by Professor Berger,<sup>10</sup> of Vienna, deal with the subject of diagnosis. For the most part, the methods in use, and the deductions therefrom, are very much as in England. He recognizes three types of history. In the *first type*, 66 per cent, there is a short history of gastric symptoms; in the *second*, a long history, 18 per cent between six and twenty-four months, and 14 per cent over two years. In the *third type*, 2 per cent, there are no gastric symptoms at all. Occult blood in the stools can be found in from 88 to 100 per cent of the cases. The most reliable guide to-day is the X-ray examination. When it shows an ulcer, it is useful to remember that the crater is under one inch across in 92 per cent cases of ulcer, but only in 23 per cent cases of cancer (Alvarez and Garty). Gastroscopy is much more used on the Continent than in England, and it has its uses when the X-ray diagnosis is uncertain, particularly for cancers close to the cardia and under cover of the ribs. It permits of the excision of the mucous membrane for microscopic diagnosis. In Gutzeit's hands, X rays and gastroscopy agreed on a diagnosis of cancer in 21 cases, in 6 X rays were positive and gastroscopy negative, in 3 X-rays were uncertain and gastroscopy positive, and in 2 both

were wrong. The risks of this method of examination appear to be very small. According to Hübner, the mortality in 3627 observations was 0.27 per cent; another series is published of 2200 gastroscopies without a death. At present, in Austria, 60 per cent cases of cancer of stomach are already inoperable when diagnosed, but it seems probable that in the best hands and using all available methods this figure could be reduced to 40 per cent.

**TREATMENT.**—Following Berger's papers on diagnosis, Professor Finsterer,<sup>11</sup> of Vienna, contributes a series of very full articles on the treatment of cancer of the stomach, well worth studying by those who can read German. He attaches great importance to a diagnostic laparotomy under local anaesthesia in doubtful cases. His gastric resections are nearly all done under local and splanchnic anaesthesia, which reduces the mortality from heart failure and shock, and of 230 cases only 2 died of pneumonia. In the after-treatment, he attaches importance to breathing exercises. If complicated resections, stomach and colon, are necessary, the death-rate is high, about 48 per cent. He advises total removal of the great omentum. His death-rate after gastroenterostomy is 18 per cent. After resection, of 199 cases, 34 died. There were 50 free from recurrence five to eighteen years after operation. (For Finsterer's figures, see MEDICAL ANNUAL, 1931, p. 449.)

T. Fohl and E. Schneider<sup>12</sup> agree in regarding extirpation of the great omentum as a step in the direction of improvement in the recurrence-rate.

As a corrective to pessimism, A. Schwyzer<sup>13</sup> relates a case operated on for proved cancer of the stomach free from recurrence twenty-four years afterwards.

**Gastrojejuno-colic Fistula.**—N. Spinelli,<sup>14</sup> writing from the clinic of Professor Alessandri at Rome, describes two cases. The fistula may be well shown by the skiagram after barium. The treatment advocated is resection of the pyloric part of the stomach with the fistula, closure of the hole in the colon, and either gastrojejunostomy or, better if possible, gastroduodenostomy, either terminal or end-to-side.

**REFERENCES.**—<sup>1</sup>*Deut. Zeits. f. Chir.* 1930, July, 125; <sup>2</sup>*Mitteil. a. d. Grenzgeb. d. Med. u. Chir.* 1930, xli, 627; <sup>3</sup>*Surg. Gynecol. and Obst.* 1931, June, 1075; <sup>4</sup>*Arch. f. klin. Chir.* 1931, May, 220; <sup>5</sup>*Med. Jour. and Record*, 1931, April, 367; <sup>6</sup>*Ann. of Surg.* 1930, Dec., 1114; <sup>7</sup>*Med. Jour. and Record*, 1931, June, 531; <sup>8</sup>*Surg. Gynecol. and Obst.* 1931, May, 945; <sup>9</sup>*Med. Press and Circ.* 1931, May, 369; <sup>10</sup>*Wien. klin. Woch.* 1931, Jan., 71, 108; <sup>11</sup>*Ibid.* 1931, March, 341, 377, 415; <sup>12</sup>*Deut. Zeits. f. Chir.* 1931, May, 317; <sup>13</sup>*Ann. of Surg.* 1930, Oct., 540; <sup>14</sup>*Policlinico*, 1931, June, 310.

**STOMACH, SYPHILIS OF.** (See GASTRIC SYPHILIS; SYPHILIS.)

**STRABISMUS.** (See SQUINT.)

**STREPTOCOCCAL PERITONITIS.** (See PERITONITIS.)

**STREPTOCOCCUS INFECTIONS.** (See also SKIN, STREPTOCOCCAL INFECTIONS OF.) J. D. Rolleston, M.D., F.R.C.P.

**ETIOLOGY.**—In a symposium on this subject similar to that held last year on staphylococcal infections (see MEDICAL ANNUAL, 1931, p. 448), J. A. Ryle<sup>1</sup> states that apart from surgical injuries the most apparent predisposing causes of streptococcal fever are other infections, such as influenza, scarlet fever, measles, and staphylococcal infections. The principal sites or modes of infection are as follows: (1) A needle prick or hang nail; (2) Any punctured wound or laceration; (3) Corn lacerated by injudicious paring; (4) Mosquito bite; (5) Infected hæmatoma; (6) Tonsillitis; (7) Throat infection in patients after tonsillectomy; (8) Middle-ear infection with, or more rarely without, mastoiditis or lateral sinus thrombosis; (9) Infection of one or more of the accessory sinuses; (10) Infected tooth socket without, or following, extraction; (11)

Ulcers after confinement or abortion; (12) Acutely inflamed viscous with peritoneal infection.

Streptococcal puerperal sepsis is described by G. F. Gibberd,<sup>2</sup> acute streptococcal infections of the throat by W. M. Mollison,<sup>3</sup> hemolytic streptococci in the mastoid by T. B. Layton,<sup>4</sup> diseases of the skin due to streptococcal infection by H. W. Barber<sup>5</sup> and L. Forman,<sup>6</sup> and apical infection of the teeth by A. Bulleid.<sup>7</sup>

**SYMPTOMS AND COMPLICATIONS.**—According to Ryle,<sup>1</sup> rigors or high fever with chilliness and malaise is the first manifestation of streptococcal fever. In the graver cases the temperature rapidly rises to 104°–105° or higher, and death may occur in a few days. In the more chronic cases there is a regularly remittent or intermittent pyrexia. The high fever is accompanied by delirium, prostration, restlessness, sighing, vomiting, a dry, red tongue, and splenic enlargement. Four manifestations are characteristic of hemolytic streptococcal infection, viz.: (1) diarrhoea, (2) albuminuria with red cells, (3) rapidly progressive anemia, and (4) smooth, red, desquamated and sore tongue. Various rashes—scarlatiniform, morbilliform, a blotchy erythema, or, more rarely, petechiae—may appear within the first few days, and are usually transitory.

**DIAGNOSIS.**—For the differential diagnosis of streptococcal from staphylococcal fever, see *MEDICAL ANNUAL*, 1931, p. 448. Pneumococcal fever is distinguished by the absence of any primary focus, the hot dry skin, herpes labialis, and the considerable rise in respiration-rate even in the absence of patent lung signs. Enteric fever is excluded by the leucocyte count and blood cultures (Ryle<sup>1</sup>).

**PROGNOSIS.**—The following points favour a good prognosis: (1) A surgically accessible focus of invasion; (2) Survival beyond the first fortnight; (3) A high leucocytosis; (4) Localizations amenable to surgical treatment. The meninges and pericardium are unfavourable localizations. Blood-borne infections of the peritoneum are also unfavourable (Ryle).

**TREATMENT.**—According to Ryle, the principles of treatment include: (1) Good nursing; (2) Copious fluid intake up to six pints or more in the day, together with glucose or alkalis during the invasion when the heart is severely taxed and febrile acidosis and vomiting are common; (3) A watch for the development of infections in the joints, pleura, and pericardium; (4) Morphine for pain, restlessness, and sleeplessness; (5) Immobilization of infected joints. The value of **Antistreptococcal Serum** is doubtful.

V. H. Comber<sup>8</sup> records 8 cases of streptococcal septicæmia in children aged from 2½ to 10 years treated by **Scarlet Fever Antitoxin** with good results in 5 cases, while in the remaining case, which proved fatal, life was prolonged but death was due to streptococcal meningitis.

**REFERENCES.**—<sup>1</sup>*Guy's Hosp. Rep.* 1931, lxxx, 1; <sup>2</sup>*Ibid.* 28; <sup>3</sup>*Ibid.* 55; <sup>4</sup>*Ibid.* 63; <sup>5</sup>*Ibid.* 92; <sup>6</sup>*Ibid.* 110; <sup>7</sup>*Ibid.* 116; <sup>8</sup>*Lancet*, 1931, i, 698.

## SUBMAXILLARY GLAND, STONES IN.

*Sir W. I. de C. Wheeler, F.R.C.S.I.*

Hamilton Bailey<sup>1</sup> recommends that if symptoms recur after removal of stone from Wharton's duct, extirpation of the gland should be advised in every case. He thinks that Ludwig's angina originates in an infection of the submaxillary salivary gland. This infection is not necessarily consequent upon a stone, but in two cases it was possible to connect salivary calculus with the production of virulent spreading cellulitis. With regard to Ludwig's angina, division of the mylohyoid muscle is suggested to expose the deep position of the submaxillary gland, instead of the time-honoured multiple incisions in the neck. A negative X-ray does not eliminate the possibility of stone within

the gland. An incision parallel to the lower border of the mandible is recommended. The facial artery and vein come easily into view and can be ligatured. If the inframandibular branch of the facial artery is cut, the corner of the mouth droops but soon recovers. This incision lies in the shadow of the jaw; the linear scar is practically invisible.

The object of this communication is to recommend removal of the submaxillary gland, when clinical features point to calculus within the gland, and in all cases of recurrent submaxillary salivary calculus.

REFERENCE.—<sup>1</sup>*Practitioner*, 1931, June, 671.

### SUBPHRENIC ABSCESS.

*A. Rendle Short, M.D., F.R.C.S.*

Reviewing the experience of recent years at Guy's Hospital, W. Doherty and R. P. Rowlands<sup>1</sup> call attention to the fact that subphrenic abscess is much less common than it used to be. An exploratory operation through the abdomen is much safer than the insertion of a large needle. Drainage should be below the pleura, not transpleural.

Gatewood,<sup>2</sup> of Chicago, points out that the mortality, 30 per cent in 41 cases, is still too high. Subphrenic abscess ought always to be thought of when an abdominal case does not go on well after operation. H. P. Brown,<sup>3</sup> of Philadelphia, reports a death-rate of 44.4 per cent in 18 cases. His experience is that X-ray diagnosis, though valuable, is by no means infallible.

REFERENCES.—<sup>1</sup>*Brit. Med. Jour.* 1931, i, 168; <sup>2</sup>*Amer. Jour. Med. Sci.* 1930, Sept., 398; <sup>3</sup>*Ann. of Surg.* 1931, May, 1075.

### SULPHÆMOGLOBINÆMIA.

*Stanley Davidson, M.D., F.R.C.P.E.*

In a very interesting paper G. A. Harrop and R. L. Waterfield<sup>1</sup> describe 10 cases of sulphæmoglobinæmia. The drug causing the condition in 8 of the 10 cases was acetanilide, taken over long periods. Extreme constipation was also present, thus allowing excessive amounts of hydrogen sulphide to be absorbed. The authors do not believe that the aniline derivatives, such as acetosalicylic acid, have any effect in producing this condition. After reviewing the clinical signs and symptoms carefully, and the methods of making a diagnosis, they describe experimental work on dogs in which they showed that methæmoglobinæmia could be produced by certain drugs, such as aniline, acetanilide, and acid-acetphenetidin. Sulphæmoglobinæmia resulted if sulphur was given in addition. They lay great importance on the point that whereas methæmoglobinæmia disappears rapidly in forty-eight hours, sulphæmoglobinæmia takes many days to do so.

REFERENCE.—<sup>1</sup>*Jour. Amer. Med. Assoc.* 1930, Aug., 647.

### SUPRARENAL GLANDS.

*W. Langdon Brown, M.D., F.R.C.P.*

#### Addison's Disease.—

ETIOLOGY.—O. Saphir and H. F. Binswanger<sup>1</sup> report cases with some of the features of Addison's disease due to cortical insufficiency associated with contraction of the cortex, which, following Kovacs, they attribute to the action of a cytotoxin.

DIAGNOSIS.—Theodore Thompson<sup>2</sup> confirms Rolleston and Boyd's observation made in 1914 that X-ray examination will reveal calcareous deposits in the adrenals in cases of Addison's disease where chronic tuberculous changes are present, whereas, when the disease is due to atrophy, the results are naturally negative. L. G. Rowntree and others<sup>3</sup> find that 25 to 40 per cent of cases show such calcification to X rays. It may be remembered that Byrom Bramwell in 1923 also called attention to the value of this method

of diagnosis. J. M. Rogoff<sup>4</sup> attaches diagnostic importance to an early aversion to fatty food and to a dull ache on pressure in the costolumbar angle. R. Targowla,<sup>5</sup> making use of the fact that in man the subcutaneous injection of morphine hydrochloride produces a rise of blood-sugar, apparently through its action on the adrenals, adduces the failure of such an injection to produce a rise as evidence of adrenal deficiency.

**PROGNOSIS.**—Saphir and Binswanger quote Maranon in support of the view that early pigmentation in Addison's disease means a slower course and a better prognosis.

**TREATMENT.**—The work of Stewart and Rogoff on the part played by the adrenal cortex rather than by the medulla in Addison's disease (see MEDICAL ANNUAL, 1930, p. 487) has naturally stimulated interest in the treatment of Addison's disease by cortical extracts. F. A. Hartman and others<sup>6</sup> report a case treated successfully with one such extract—**Cortin**—at first intravenously and subsequently subcutaneously. Rogoff uses his extract, known as **Interrenalin**, with intravenous saline, sometimes with 10 per cent of dextrose added. Rowntree finds these **Dextrose-saline** injections combined with 3.5 c.c. of cortical hormone daily very helpful. He describes the earlier Muirhead treatment, which consists of pushing **Epinephrin** to the point of tolerance by combined subcutaneous rectal and oral routes, while the cortex or the whole gland is given at the same time by the mouth. He regards **Ephedrine** as valuable, just to keep the blood-pressure up. W. B. Coffey and J. D. Humber<sup>7</sup> claim to have prepared a cortical extract which leads to necrosis of new growths with relief of pain. G. A. Harrop, junr., W. W. Swingle, and others did not find any definite benefit from the cortical hormone in the treatment of hyperthyroidism, as had been alleged.

**Adrenal Tumours.**—L. R. Broster<sup>8</sup> has made a useful classification of adrenal tumours, according to whether or not they are associated with virilism :—

*A. Tumours of the Adrenal Cortex* which are associated with virilism. (1) Hyperplasia; nodular and diffuse; either bilateral or unilateral. (2) Adenoma. (3) Hypernephroma of the adrenal cortex. (4) Carcinoma.

*B. Tumours Resembling the Adrenal Cortex* which are not associated with virilism. (1) Renal hypernephroma. (2) Ovarian hypernephroma. (3) Lutein tumours.

Nearly forty years ago Grawitz regarded all tumours closely resembling the cortex in structure, but arising outside the sphere of the adrenals, as originating in adrenal rests, but Glynn has shown that this view is too rigid. It would appear that the second group in the above classification can be sharply marked off from the first in that they have no masculinizing effect. The available evidence points to the cells of the adrenal cortex and the sustentacular cells of the testis as the seat of the masculinizing hormone, the latter being the more potent in producing the finer points of male characterization. In the adrenal cortex it is probable that the cells of the outer zone are the more directly responsible. This is not surprising in view of their common origin with the interstitial cells of the testis. As pointed out by earlier writers, the type of virilism resulting from such tumours depends on the time of onset; the earlier in life they occur, the more they influence structure; later on they chiefly affect function.

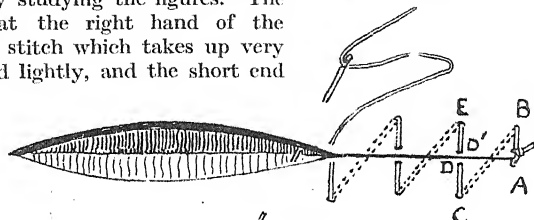
**REFERENCES.**—<sup>1</sup>*Jour. Amer. Med. Assoc.* 1930, Oct. 4, 1007; <sup>2</sup>*Lancet*, 1930, ii, 785; <sup>3</sup>*Jour. Amer. Med. Assoc.* 1931, Jan. 24, 231; June 6, 1935; <sup>4</sup>*Canad. Med. Assoc. Jour.* 1931, Jan., 43; <sup>5</sup>*Presse méd.* 1930, Aug. 9, 1077; <sup>6</sup>*Surg. Gynecol. and Obst.* (abstracts), 1931, April, 365; <sup>7</sup>*Calif. and Western Med.* 1930, Sept., 640; <sup>8</sup>*Brit. Med. Jour.* 1931, i, 743.



**SURGICAL TECHNIQUE.**

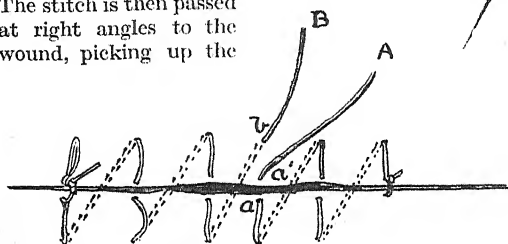
*Sir W. I. de C. Wheeler, F.R.C.S.I.*

**Continuous Eversion Stitch.**—A. Edmunds<sup>1</sup> some years ago recommended a suture which, after drawing the deeper parts of the wound together, also passed through its extreme edges. The object of this is to prevent inversion and secure an accurate adjustment of the cut surfaces. The following is his description of a modification of this stitch. It is a continuous suture, and can be inserted quite easily and quickly. The method of doing this will be readily understood by studying the figures. The suture is commenced at the right hand of the incision by putting in a stitch which takes up very little tissue. This is tied lightly, and the short end cut or clamped (*Fig. 102, A*). The needle is then inserted at B and passed obliquely to the left, emerging at C about half an inch further along the wound. The stitch is then passed at right angles to the wound, picking up the



*Fig. 102.*

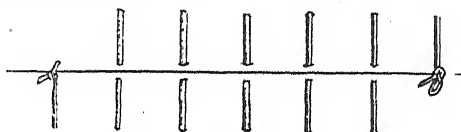
(*Figs. 102-104 by kind permission of the 'Lancet'.*)



*Fig. 103.*

extreme edges of the divided skin at D D'. The needle enters the tissues again at E and is passed obliquely to the left as before until the wound is closed. The thread is then fastened off with a lightly tied stitch, similar to that with which the suturing commenced.

If a fresh thread is needed, the needle is unthreaded after it has passed through the extreme edges of the wound, and the second thread started by passing it obliquely and to the left. In the diagram (*Fig. 103*) the first thread A is shown emerging at *a a'*, and the second thread B entering at *b*. Sewing with this second thread is then carried on until the wound is closed. The suture is then finished off as before.



*Fig. 104.*

The two loose ends of the threads A and B are then tied together, any adjustment of the tension being made at the same time. If the edges of the wound are everted and not in apposition they can easily be adjusted with a swab or a pair of forceps, and when this has been done they remain in position. *Fig. 104* shows the appearance of the completed suture line.

**Twin Needle for Interrupted Sutures.**—The reviewer<sup>2</sup> describes a new twin needle for the rapid introduction of the Halsted form of interrupted suture. The needle is of the Doyen variety. Silkworm gut or catgut suture is passed through both eyes simultaneously by means of a straight needle

(Fig. 105). It has been found useful in cases where difficulty is experienced in fat subjects or when laxity cannot be obtained. It is also found convenient for overlapping of the aponeurosis in cases of ventral hernia after the Mayo method, and has many other uses.

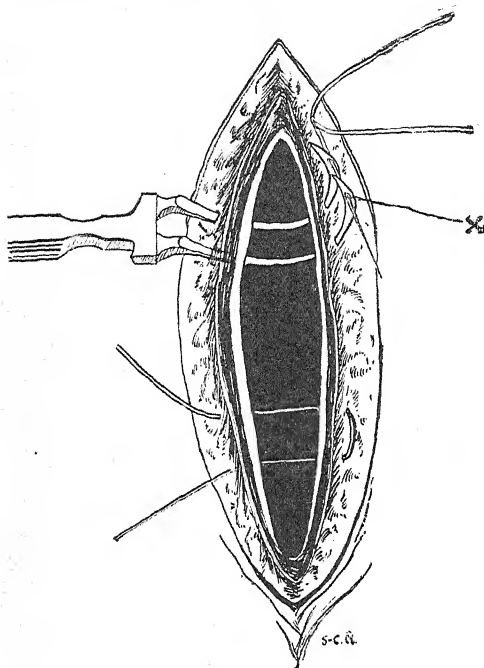


Fig. 105.—Wheeler's twin needle. Note method of threading with straight sewing needle. (By kind permission of the 'British Medical Journal'.)

When the needle is threaded the assistant pulls the suture lying between the two needles into a long loop. It is important that he should not pull towards himself but upwards towards the ceiling in order to prevent fraying of the catgut. The needle is then withdrawn and the suture tied. It is made by Messrs. Down Bros.

#### Continuous Medication.—

A small point in connection with surgical technique which is mentioned by G. A. Hendon<sup>3</sup> deserves special attention. Whenever continuous medication is employed by the drop method through a tube, whether into the rectum, the subcutaneous tissues, or into a vein; or, again, in the case of continuous irrigation of the bladder through a catheter after prostatectomy: it should be remembered that any required drug can be injected through a hypodermic needle into the delivery tube of the apparatus. In this manner adrenalin can be injected

through the wall of a catheter in cases of bleeding after prostatectomy. Iron, arsenic, or calcium can be introduced while saline is flowing into the cellular tissues of the breast, or stimulants such as coffee may be passed into the rectum during proctoclysis, with a large needle and syringe. By simply puncturing the rubber tube with a needle, no disturbance of the patient or apparatus becomes necessary.

**Sterilization of the Hands.**—Kocher, of Berne, always taught that it was a mistake to use nail brushes as they cause the skin to become rough. After thorough washing in running water most surgeons immerse the hands in an alcoholic solution and dry them with a sterilized towel, before putting on powdered gloves. **Pyxol** has been strongly recommended as an efficient manual disinfectant. McDonald's solution consists of pyxol, 2 parts, alcohol (denatured) 60, and acetone 40.

**Team Work.**—Every effort should be made to educate the public in the knowledge that a surgeon cannot perform his work to his full capacity unless he has the same assistant, the same anæsthetist, and his own instruments in every case. He should not be asked to perform a difficult operation in a strange theatre on an unknown operating-table and where the light is different from that to which he is accustomed. This is all commonplace knowledge

within the ranks of the profession, but members of the public still persist in choosing a private hospital known to themselves, and are often disturbed if their family physician is not employed as anæsthetist or as the first assistant. It is the duty of the surgeon not to acquiesce in any request which may militate against the success of the operation. The matter is made simple to members of the public if it is explained how difficult it is to drive another man's motor-car on the first or second occasion, and that tennis cannot be played up to full form with a strange racket on an unfamiliar court and with a partner who has never been played with before.

REFERENCES.—<sup>1</sup>*Lancet*, 1930, ii, 849; <sup>2</sup>*Brit. Med. Jour.* 1931, June 6; <sup>3</sup>*Jour. Amer. Med. Assoc.* 1930, Oct. 18, 1175.

### SWINE ERYSIPELAS. (See ERYSIPELOID.)

### SYMPATHETIC NERVOUS SYSTEM, SURGERY OF.

Geoffrey Jefferson, M.S., F.R.C.S.

**The Rôle of the Sympathetic Nervous System.**—Great interest and activity have been exhibited during the past few years in investigating the functions of the sympathetic nervous system, its influences on normal and disease processes, and particularly on the removal of those influences as a means of cure or at least relief in certain diseases.

The part played by the sympathetic nervous system can most easily be stated in terms useful clinically by considering separately its activities in the limbs and head, and in the chest and abdomen.

*In the Limbs.*—Sympathetic fibres stream out into the limbs to subserve certain entirely subconscious or involuntary processes: (1) The control of the calibre of the vessels; (2) To supply the sweat-glands with fibres exciting secretion; (3) To the erector mechanisms of the hairs of the skin; (4) To the voluntary muscles. Its influences on three out of the four structures have often been put to the test of operation—for the removal of vasospasm, for the cure of hyperidrosis, and for the relief of spastic or tonic overload in voluntary muscles. Sympathectomy is also being performed for scleroderma in such cases as have a vasospastic background, for polyarthritis in young persons, and for retinitis pigmentosa.

*In the Brain.*—Within the cavities of the skull, thorax, and abdomen the predominant vasoconstrictor influence of the sympathetic, so obvious in the limbs and on the surface of the body, is less in evidence. It has been one of the tenets of orthodox physiological teaching that no vasoconstrictor influences were manifest in the vessels of the brain, although some measure of dissent has long been voiced. It was clear, of course, that constriction of the great carotid vessels could alter the volume of the blood entering the skull, but the recent work of H. S. Forbes and H. G. Wolff<sup>1</sup> has established that constriction of the cortical vessels can be brought about by appropriate stimuli, though the change is so slight that delicate means are required to register it.

There have been in the past great divergences of opinion between the physiologist and the clinician on sympathetic activities. For example, the clinician often needed to invoke cerebral angiospasm to account for transient palsies which could not reasonably be accounted for on the grounds of actual anatomical damage, whilst the physiologist held that there was no mechanism by which spasm could occur. Recent work has decided the question in favour of the clinician, but we must be wary of abusing this new evidence and calling it up to explain every obscure case. There is no doubt that the supposed absence of cerebral vasoconstrictors has been a great help to neurology rather

than a hindrance, and it is clear that the amount of possible constriction is very slight.

*In the Abdomen.*—The splanchnic vessels are comparable in their behaviour to the cerebral vessels, and have the further disadvantage to the surgeon of forming a reservoir of such size that the blood may, especially under the vasodilating influences of substances such as histamine (liberated by massive tissue injury), withdraw itself there and seriously diminish the volume of actively circulatory blood. No surgical attempt has been made on the blood-vessels of the abdomen save denervations of the renal vessels for pain and anuria (persistent diuresis follows experimental perirenal arterial sympathectomy: all the effects being due to increased vascularity and none to effects on the cells direct).<sup>2</sup> As for the viscera themselves, removal of the sympathetic fibres is finding increasing application. The smooth muscle in the walls of the muscular abdominal organs is supplied with internal nervous mechanism which allows of its contraction under suitable conditions long after all its connections with the body have been severed. Normally it is under the influence of a parasympathetic supply (from the vagus and sacral nerves), which is motor, or rather excitatory, and of a sympathetic supply, which is inhibitory. The removal of this latter influence by well-planned operations has been now carried out on the stomach on numerous occasions for pylorospasm (Latarjet), and on the large intestine (Royle,<sup>3</sup> Wade,<sup>4</sup> Rankin and Learmonth,<sup>5</sup> Adson<sup>6</sup>) for megacolon. Latarjet's operation is simplicity itself, for it is necessary only to divide the gastro-hepatic ligament to the left of the hepatic vessels. The parasympathetic influence of the vagus, which is believed to have charge of the acid secretion of the stomach, has been interrupted by division of the easily distinguishable branches of the vagus on the stomach itself, with consequent reduction of acidity. Our most recent information on this point proves that the lowered acidity is temporary only and passes away after a few months. The engaging idea of curing the hyperacidity which is the bugbear of the surgeon in his dealing with duodenal ulcer in particular is therefore not as soundly based on fact as had been hoped.

Spasm of the internal sphincter of the bladder causing retention in cord lesions has been attacked by division of the presacral and hypogastric nerves (J. R. Learmonth<sup>7</sup>), but these cases require the most careful selection. Enthusiastic reports have been published on the relief of pelvic pain arising in bladder, prostate, uterus and tubes, either by **Peri-arterial Sympathectomy** on the aorta and iliac vessels, or by **Section of the Presacral**. This brings us to the sensory side of the subject. It is admitted that sympathetic fibres are the only ones by which painful visceral impulses can start on their course to reach the spinal cord and so come to consciousness, whether these sensations are the result of over-activity of normal structures, as in intestinal colic, or are the warning messages of an inflamed organ. Little progress has been made in the cure of intractable visceral pain, largely because in the present state of our knowledge we are not able to intervene intelligently. Tentative steps have been taken in the treatment of angina pectoris and certain forms of tabetic crises by cutting afferents, but the results of these operations are not so satisfactory as those in which relief has been obtained in diseases by interrupting the afferent influences. This may be because in the latter we have had the advantage of objective phenomena to control our results, and hence to learn from failure what the operative indications should be. It seems probable that the use of novocain to induce sympathetic plexus block will lead to further increases in our knowledge of sympathetic-borne pain and allow of more rational intervention.

**Surgery of the Sympathetic.**—We still lack precise knowledge on a very

fundamental point—namely, how far some diseases are essentially due to primary sympathetic disease. Evidence has steadily been accumulating since the early days of removal of sympathetic chains and ganglia that the structures removed were not normal. Jonnesco in his superb monograph on the cervical sympathetic described the changes, whilst more recently Asami<sup>14</sup> has pointed out the cell degenerations and fibrosis which many cases exhibit. Most recent work by J. S. B. Stopford and E. D. Telford,<sup>8</sup> still proceeding, seems to be likely to confirm the view expressed by Asami that a relation exists between primary changes in the sympathetic and secondary changes in the vessels. How far this may be true of the other diseases for which sympathectomy is being carried out remains to be seen, but the alterations in the ganglia and connecting trunks are often so pronounced that they leave no room for doubt. However this may be, there is now no question but that the influences of the sympathetic nervous system may be damped down or removed with great benefit to the sufferer in certain specific instances.

Dubois Raymond, the great physiologist, many years ago suggested that migraine was due to spasm of the cerebral vessels, and suggested cure by removal of sympathetic control. W. E. Dandy<sup>9</sup> has recently carried the operation out with success up to the time of publication, a few months after operation. Such cases would have to be very carefully selected for operation, and possibly limited to those who present recognizable vasospasm in superficial vessels in addition to the conjectural spasm of unseen arteries within the skull.

*Treatment of Raynaud's Disease.*—This troublesome and indeed often finally disabling affection has given excellent results with sympathectomy, especially in the young before secondary anatomical changes have been established. The pathology of the condition is still debated, and Lewis's work tends to disprove the idea started by Raynaud himself that the vasospasm is due to central chronic sympathetic over-activity. (For an excellent account of the innervation of the blood-vessels, see Stopford<sup>20</sup>). Lewis shows that Raynaud patients may still have vascular spastic crises even after a central sympathectomy. The operation, none the less, diminishes the severity of these attacks very considerably and almost all patients seem to be grateful for the operation, and this is justification enough if there are no ill-effects; so far there are none recorded, nor do they seem to be probable.

The operation performed is excision of the stellate ganglion (i.e., the lowest cervical and first sympathetic ganglia) or, better still, section of the thoracic sympathetic trunk and removal of accessible ganglia through a posterior operation. The advantage of the latter, which is a difficult undertaking, is that the efferent impulses to the limb stream upwards from the thoracic spinal segments. These cannot so surely be suppressed by an operation from above through the usual cervical incision, for it is difficult to get deep enough into the thorax to reach the stellate ganglion and cut the chain below the first thoracic ganglion and excise the whole mass. Extirpation of the complete cervical sympathetic chain only affects the limbs by reason of removal of its lower end, hence the low operation is the one of choice. A. W. Adson<sup>10</sup> resects the neck of the first or second rib (both may be excised) from behind, and seeks the thoracic ganglia at the root of the neck in the posterior mediastinum. Anatomically and physiologically this is the method of choice; it is a deep dissection, but worth learning. Through a mid-line incision from the spine of C. 5 to that of T. 2 the muscles are separated from the first rib. About 3.0 cm. of the rib and the transverse process of the first thoracic vertebra are removed and the ganglion sought between the trunks of C. 8 and T. 1, and then as much as can be pulled up of the thoracic chain is freed and

lifted out. The bilateral operation may take three hours if carefully and fastidiously performed.

*Chronic Arterial Occlusion* (thrombo-angiitis obliterans, some cases of arterio-sclerosis).—In those distressing cases where the circulation is failing (usually in the lower limbs) because of chronic endarterial proliferation, we have long felt the need for some operation which would give relief. Pain is often severe and unrelenting, and in addition the patient is threatened with amputation of one or both limbs. It is clear that sympathectomy cannot cause occluded vessels to become recanalized, but it could cause to dilate such vessels as were not yet too severely diseased, thus relieving, maybe, a threatened extremity. Obviously we need tests which will tell us to what stage the disease has progressed and whether in fact there are any vessels capable of permanent relaxation. We should do well to know additionally how great a relief to expect, for it might be that although some undiseased vessels did exist they were too few to be of any real service. Fortunately such tests have been discovered. The principle of all of them is the same—measurement in the rise of skin temperature after artificial dilatation of the vessels has been brought about.

*Fever Test.*—The protein-shock test of G. E. Brown<sup>11</sup> was the first employed, but it has been largely superseded by better methods. It consists in the intravenous injection of 50 million or more dead triple typhoid bacilli and measurement of rise in the surface temperature of the affected limb during the artificial fever so induced. The relation of the rises in oral and surface temperature comprises the 'vascular index'. The fever test, though a clumsier one than the novocain tests now to be mentioned, has in its favour this—that patients with obliterative vascular changes receive considerable help from the protein shock. Indeed, this treatment is of well-established value for such cases, quite apart from surgery.

*Spinal Anæsthesia.*—This much crisper method of causing vessel relaxation we owe to J. J. Morton and W. J. M. Scott;<sup>12</sup> it depends on the fact that under high spinal anæsthesia the skin temperature rises in the lower limbs. In vasospastic affections of the lower extremities the temperature of the feet may rise 10° to 18° F. A case exhibiting such a rise would clearly be benefited by permanent sympathetic denervation, but rises of this quality will not be found in most obliterative arterial conditions. Unless a considerable rise is obtained, it would do but little good to excise the sympathetic, though there is this to be said for it, that great relief from pain might be afforded.

*Nerve-block.*—Lewis showed that injections of novocain into the peripheral nerves caused vasodilatation roughly in their area of cutaneous supply. This can be made use of instead of spinal anæsthesia if the surgeon prefers it (ulnar for the arm, sciatic for the leg). This test has demonstrated something of great importance—namely, that the vasomotor fibres run out in the peripheral nerves, and not, as had at one time been thought, in the peri-arterial plexuses. The recognition of this fact is likely to relegate the once fashionable operation of peri-arterial sympathectomy to the background. J. C. White,<sup>13</sup> of the Circulatory Clinic of the Massachusetts General Hospital, has introduced paravertebral novocain (1 per cent) block as another means of releasing the vessels from sympathetic control, and has published most important observations illustrating the choice of cases for operation. This is a useful method for the arm and is easily done, but spinal anæsthesia is the method of choice for the legs.

If failures are to be averted, it is important that wise selection should be made, and the methods outlined above give valuable advice to the surgeon as to whether he should operate or not. Clearly enough, when a new method

arises which has given dramatic cures in many published cases, there will be a great tendency to apply the operation to sufferers who may be unsuitable and are really incurable. However, the incurable cases will have been of service if they impress on the profession at large the necessity for earlier intervention, before the occlusion of the vessels has proceeded too far and too widely. Failures are not to be expected in purely angiospastic cases, always provided that the tissues have become so altered by the long-continued insults of anæmia and a slow blood-stream that does not allow of a sufficient washing out of catabolic products.

Lastly, it should be recorded that A. W. Adson, P. A. O'Leary, and G. E. Brown<sup>24</sup> advise ganglionectomy for those cases of scleroderma which have a proved strong element of arterial spasm.

*Hirschsprung's Disease* (see also article HIRSCHSPRUNG'S DISEASE).—Excellent results have been achieved in these cases by lumbar sympathectomy; usually it will suffice if the left chain is removed by a transperitoneal exposure, and this is a simple procedure. Megacolon tends to affect the sigmoid flexure more than the rest of the colon, hence the unilateral operation, but if the dilatation were widespread it would be wiser to resect both lumbar chains. This removal includes the second, third, and fourth ganglia, the second being the highest which can be reached without danger of damage to important structures crossing it transversely, such as the pancreas on the left, and duodenum on the right. F. W. Rankin and J. R. Learmonth<sup>5</sup> perform a limited excision; the presacral nerve and fibres running with the inferior mesenteric artery are isolated and removed (but see a warning note below on division of the presacral nerve in males). Removal of the left lumbar chain seems on the whole to be the operation of choice.

It appears that the effects of the operation are better in children than in those of more advanced age, for whilst tone is undoubtedly increased, with narrowing of the calibre of the gut, peristalsis is not always improved in comparable degree. The results recorded by the surgeons mentioned already have been most encouraging. D. E. Robertson,<sup>25</sup> of Toronto, has reported eight personal cases recently, all excellent. The operation is an advance of any treatment hitherto available for this condition. In megacolon again spinal anæsthesia is of great help in pre-operative study of the case when a barium enema is used. Much less fluid can be injected under 'spinal' owing to the contraction of the intestine released by novocain from its sympathetic inhibition, and the calibre approaches that which will result from the total removal of these influences by the projected operation (Morton and Scott<sup>12</sup>). Use should be made of these facts before submitting the patient to operation.

It is interesting to recall that suppression of inhibition has proved at times of use in overcoming paralytic ileus in general peritonitis and may result in bowel action for the same reason that the Hirschsprung patient's colon contracts under the same physiological sympathetic block. Nervous influences stream out originally by the spinal roots from the lateral cell columns in the spinal cord, and hence come under the influence of the drug just as do the cerebro-spinal nerve fibres themselves.

*Angina Pectoris*.—For many years surgeons have sought a means whereby the pains of angina pectoris could be relieved or even abolished. Clearly nothing could be done for the disease itself, for even at this day there is no certainty as to the precise mechanism by which the anginal attacks are produced. Operation would have to be limited necessarily to the section of afferent nerves. Many studies of the innervation of the heart, the coronary arteries, and the aorta have therefore been undertaken; for the ordinary anatomical descriptions current in earlier text-books and monographs were

not sufficiently precise as to which sympathetic nerves were motor and which sensory. It is now known that not only do fibres run to the heart from the three ganglia of the cervical sympathetic chain as the superior, middle, and inferior cardiac nerves, but that a further series connect it up with the upper four to six thoracic intercostal nerves. Largely as a result of the operative resections of the sympathetic trunk, its ganglia, or its branches, a great deal has been learned concerning the precise pathways of cardiac pain. The various operations which were carried out, notably the ingenious variations of D. Danielopolu<sup>16</sup> on Jonnesco's original sympathetic ganglionectomies, need not be particularized here. The disadvantage of difficult and tedious dissections on anginal patients are sufficiently obvious. Nor were the results of excisions of the cervical ganglia particularly satisfactory, though notable relief occurred in about half the cases which survived long enough for conclusions to be drawn. It appears that the cervical chain does not conduct to any extent painful impulses from the heart; the part of the sympathetic mechanism most closely involved extends from the lowest cervical ganglion downwards into the chest.

Open operation has been succeeded by another method at once relatively simple and much more certain in the relief which it gives. This consists in the deep injection of alcohol into those nerves whose territory is irradiated by the pain of angina—namely, the eighth cervical and upper six or seven thoracic. The alcohol injections are made as close as possible to the sides of the bodies of the vertebræ (paravertebral block), the object being to destroy not the intercostal nerves themselves but the sympathetic fibres running to them from the heart. These are finely myelinated nerves and prove to be more susceptible to alcohol than the intercostal trunks themselves. The latter are apt to be irritated by the injection, and all authors speak of skin hypersensitivity which may give trouble for some weeks (three to six) following on the operation. The cases should be most carefully selected and should come to the surgeon from a cardiac clinic. The working classes furnish the indications more often than the well-to-do, for in the one class mobility and working power are more essential. Treatment by injection has been worked out by Mandl,<sup>15</sup> but particularly by G. I. Swetlow<sup>17</sup> and by J. C. White,<sup>18</sup> of Boston. Swetlow's analysis of 22 personal cases yielded complete success in 11, good results in a further 7, and less relief in 4. The alleviation lasted several months, when re-injection may be carried out. There were no deaths. It must not be assumed that the deep injections of alcohol are entirely simple, but the method seems to be the best so far evolved. An important point is the preliminary injection of novocain as a test to determine whether the proposed more permanent injection will succeed. This must, of course, be done during an attack, fortuitous or induced. The amount of alcohol injected is 5.0 c.c. for each nerve, those of the left side being blocked first, those of the right later if the pain there warrants it.

*Gastric Crises of Tabes.*—At the present day cases of tabetic gastric crises are much less common than they were twenty years ago. But despite the improvements in the therapy of syphilis occasional cases still occur and provide most difficult problems. A variety of operations have been planned for the relief of sufferers, the most popular being posterior root section (an operation dear to neurological surgeons of the early twentieth century), and more lately subdiaphragmatic vagotomy. Neither of these steps has provided a reliable means of relief, and the additional high section of the pain tracts in the cord (chordotomy), so successful for the pain of hopeless malignant disease, has not produced a constant betterment. As in the case of angina pectoris, surgical failure has been the result of imperfect knowledge of the paths which carry



the pain to the sensorium. This knowledge is gradually increasing, and division of the sympathetic rami which carry impulses from the viscera to the lower thoracic spinal cord has given results comparable with any so far achieved. L. van Bogaert and J. Verbrugge<sup>19</sup> report their operative technique, consisting in resection of the intercostal nerves as close as possible to the sides of the bodies of the vertebrae, after removal of the transverse processes. An essential part of the operation is the securing and dividing of the sympathetic rami joining the spinal nerves. The nerves to be severed will be those which careful pre-operative study of each individual case has demonstrated to be the chief source of the pain (often the seventh to eleventh thoracics on one side or the other). The similarity between the method of Van Bogaert and Verbrugge for gastric crises and that of Swetlow and White for angina will at once be recognized. It seems probable that paravertebral alcohol block should be as successful for the one condition as for the other.

*Pelvic and Bladder Pain ; Retention.*—Resection of the presacral nerve has become popular on the Continent for two classes of cases in females : to arrest the pain of advanced malignant disease of the cervix, and to suppress the pain of dysmenorrhœa or similar internal algias of unknown origin. Striking successes are claimed for this operation particularly by Cotte and Dechaume.<sup>21</sup> Relief equally may be afforded to sufferers from tuberculous cystitis, the pains of which are often intolerable. The necessary steps are simple and have been well described by Learmonth.<sup>22</sup> Learmonth has contributed very considerably to our knowledge of the constituents of this nerve and indeed his researches into pelvic innervation are of a very high order. The retention of urine that follows many cord injuries and certain spinal diseases may be ameliorated by excision of the presacral nerve (Learmonth). This surgeon has pointed out that ejaculation is suppressed by this operation, so that it must be applied to the male with caution.

*Polyarthritis.*—Chronic polyarthritis of infective origin has also come within the range of sympathectomy. Following on their observations on the improvement in the blood-supply to the lower limbs after lumbar ganglionectomy it occurred to workers at the Mayo Clinic that permanent hyperæmia might be beneficial to patients with chronic polyarthritis. P. S. Hench, M. S. Henderson, L. G. Rowntree, and A. W. Adson<sup>23</sup> have laid down a series of rules to be observed in the selection of patients. They believe that only a small percentage of cases are eligible for the operation, and then only after all other methods of treatment (notably the elimination of septic foci) have failed. The arthritis should be of peri-articular type without notable changes in the bone, the patient should exhibit cold extremities capable of vasomotor release by one of the methods referred to above. He, or she, should be young, preferably under 35 years of age. The malady should be confined to the extremities of the limbs ; no result is obtained with shoulders and hip-joints. The value of the procedure is not yet capable of assessment and it should be used with caution. It will be of no service for osteo-arthritis in middle-aged persons.

*Retinitis Pigmentosa.*—N. D. Royle<sup>3</sup> suggests division of the cervical sympathetic trunk about its middle in the treatment of retinitis pigmentosa. This disease is characterized by degeneration of the retina consequent on spasm and degeneration of the retinal arteries. Section of the sympathetic might increase the calibre of these vessels permanently, and Royle mentions five cases, but in this paper he does not give any detailed observations on the vessels after operation, contenting himself with recording improvement in vision.

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**SYPHILIS.** (See also EAR, AFFECTIONS OF; LIVER, GUMMA OF; OPTIC ATROPHY; ETC.) Col. L. W. Harrison, D.S.O.

**Serum Diagnosis.**—F. Plaut<sup>1</sup> has shown by laboratory experiment that corks used as bungs of specimen tubes can give off tannic acid to the contents and that this has an anti-complementary action which may result in non-specific positive reactions. Consequently rubber bungs should be used.

The results of the Serum Conference at Montevideo in 1930<sup>2</sup> are interesting as three of the workers had previously participated in similar conferences at Copenhagen—namely, E. J. Wyler, R. I. Kahn, and R. Müller. Wyler represented the Wassermann test, which had given the highest percentage of positive reactions in syphilis cases but no non-specific result, and Kahn and Müller their respective flocculation methods, which had proved most delicate yet specific at Copenhagen. The participation of these three workers afforded a means of comparing the methods employed in South America with those hitherto compared in Europe. The results showed a very slight difference in delicacy between Wyler's and Sordelli and Miravent's Wassermann, which proved the most delicate of the Wassermann tests which were strictly specific within the usually accepted limitations. The Kahn and the Müller tests again proved the most delicate and specific of the flocculation methods, and these in turn more delicate than the Wassermann. In sera from 27 leprosy cases without history or sign of syphilis, different workers, including the above, obtained from 5 to 9 positive reactions. The Conference repeated the recommendation that every serum ought to be tested by two methods. [It is noteworthy that in this, as in previous Conferences, there was a wide difference between the most delicate and the least delicate of the Wassermann tests and that a number of methods of the Wassermann test gave percentages of non-specific reactions which are, to say the least, disturbing. Admittedly the fact that the workers at such Conferences have to carry out their tests in strange surroundings may be a disturbing factor, but this should not make as much as 5 or more per cent difference in delicacy between any two methods, or cause a tester to return anything from 6 to 13 per cent of non-specific reactions. The Wassermann test has now been in existence for over twenty years, and, as these Conferences have shown, there are methods of carrying it out which afford completely specific results, so that there is nothing wrong with the principle of the test. It seems clear that those pathologists who are obtaining non-specific results owe it to the clinicians who have to rely on them to revise their methods. They can do this only by checking their results obtained in routine work by the clinical data. Some pathologists seem to have elaborated their tests without relation to the concordance of their results with the clinical facts, and it is not surprising that they have wandered into methods which are defective in delicacy or specificity or both. The moral for the clinician at present is to accept no result obtained in a laboratory not known to him, but to have the test repeated.—L. W. H.]

L. F. Badger<sup>3</sup> has made a comprehensive study of the literature of syphilitic serum tests in leprosy, and from this, and his results with the sera of 207 patients

tested by the Wassermann and Kahn methods, concludes that leprosy serum can give positive reactions to these tests in the absence of syphilis. He found an abnormally high incidence of positive reactions in the cases stated—namely three times as many in lepers as in a control group; they occurred nearly twice as frequently in females as in males, and were more frequent in patients under 20 years of age than in those over this age; also the reactions changed with fluctuations in the clinical manifestations of the disease.

**The Cerebrospinal Fluid in Tertiary Syphilis with Gummata.**—J. Konrad<sup>4</sup> has found the cerebrospinal fluid positive in 16 per cent of 160 cases of gumma of the skin or mucous membranes. This is fairly in agreement with Finger and Kyrle's 23 per cent of 150 similar cases. The reactions of the serum to Wassermann or flocculation tests, or both, was positive in 93 per cent of the cases. The luetin test was positive in 67 per cent of the cases, and there were proportionately more with positive cerebrospinal fluid in the luetin-negative than in the luetin-positive cases.

**The Prognosis in Cases of Syphilis with Positive Cerebrospinal Fluid** in the later years is generally agreed to be bad. A. Wittgenstein<sup>5</sup> adds evidence to the same effect. In 42 cases with negative serum and spinal fluid observed from five to ten years, 3 suffered from apoplectic attacks, quite possibly non-syphilitic, at the ages of 52, 58, and 60. On the other hand, in 30 with negative serum but positive fluid observed for the same time, 26 developed clinical signs of neurosyphilis. Of 21 with positive serum and fluid, 15 later showed signs of neurosyphilis, but of 35 with positive serum but negative fluid, only 2. The author's repeated observations of the cerebrospinal fluids of the same patients in the later years, presumably after the fifth year, have shown, in agreement with other workers, that a pathological fluid rarely returns spontaneously to normal, and vice versa. When the fluid is pathological in the later years, only the conjunction of non-specific (fever) with specific treatment of the patient will convert it to normal. When it has been so converted it usually remains so. These conclusions agree substantially with those put forward by B. Datner.<sup>6</sup>

G. L. Dreyfus and K. Mayer,<sup>7</sup> like many other workers, attach great importance to examination of the cerebrospinal fluid four years or more after infection. If it is then negative, especially on tests made at least twice at an interval of half to one year, one has little to fear from neurosyphilis. If it is positive, a malaria-salvarsan treatment is indicated, and if, by this means, it is made negative to two tests at an interval of half to one year and there is no sign of tabes, the outlook is on the whole good. The exception of tabes arises from the fact that a not unimportant percentage of tabetics have negative cerebrospinal fluid. A small proportion of cases of purely vascular neurosyphilis also have negative fluid, but with these exceptions the state of the cerebrospinal fluid is a very close index of the activity of syphilis in the central nervous system.

J. E. Moore and H. H. Hopkins<sup>8</sup> have followed out the later histories of 123 patients who when first seen from one to seventeen (average seven) years previously had pathological cerebrospinal fluid without clinical signs of neurosyphilis. The results show the grave prognostic import of changes of the severer type, i.e., positive Wassermann and colloidal reactions, particularly when the latter are of the paretic type. Out of 36 patients with fluids giving strong reactions when first seen, 12 later developed clinical signs of neurosyphilis in spite of intensive specific treatment, and in 10 of the 12 the manifestations were general paralysis or tabes.

**Marriage Test.**—G. Kertesz<sup>9</sup> advocates the examination of the spermatie fluid for infectivity by inoculating it into the vitreous of a rabbit and subsequent

observation of the regression of the luctic changes under specific treatment. The fluid is obtained in a condom or by interrupted coitus. He mentions successful cases and also the very great frequency with which the testicle is invaded by *Sp. pallida*, very often without resulting changes detectable by clinical examination. The test is not intended to supplant those commonly applied.

**Syphilis and Pregnancy.**—E. S. Coler<sup>10</sup> investigated 484 pregnancies of syphilitic women and found the foetal mortality in those who had received some anti-syphilitic treatment to be 5.1 per cent while in those who had received no treatment it was 51.4 per cent. Like most workers, he stresses the importance of commencing treatment in the first half of pregnancy. [Most agree with the finding of J. Trichinese<sup>11</sup> that infection of the foetus does not usually occur before the fourth or fifth month.—L. W. H.] E. J. Trow<sup>12</sup> analysed the histories of 43 syphilitic mothers in respect of results of pregnancy. In 22 cases where both father and mother were syphilitic 44 pregnancies before institution of treatment resulted in only 13 non-syphilitic offspring, and in 7 of these the infants were born before infection. After institution of treatment 32 pregnancies resulted in 4 syphilitic offspring, and in 3 of these the treatment during pregnancy had been nil or only slight. In 12 cases where only the mother was positive the results of 29 pregnancies before institution of treatment were 8 non-syphilitic (2 born before infection). After institution of treatment 16 pregnancies resulted in 15 non-syphilitic offspring; the failure was a miscarriage after six injections of '914' and some mercurial inunctions. In 7 illegitimate cases one pregnancy before treatment gave one syphilitic infant, and 8 pregnancies after institution of treatment resulted in 7 non-syphilitic infants. The balance of 2 cases is made up of two mothers with congenital syphilis whose two pregnancies after institution of treatment resulted in non-syphilitic infants. E. Klawns<sup>13</sup> analysed the results of 3006 syphilitic pregnancies, including his own cases and those reported in the literature, according to the ante-partum treatment. The percentage of syphilitic infants born of 1097 untreated mothers was 78.3, the figure varying with the age of the mother's infection, the race, and district. Mercurial treatment alone reduced the percentage of syphilitic offspring to 50, while treatment only during pregnancy with '606', or this combined with mercury or bismuth, resulted in from 11.4 to 20.3 per cent, and the group treated before as well as during pregnancy showed only 0.9 per cent. In association with Priessels, the author has demonstrated by radiograms a process of repair in foetal osteochondritis under anti-syphilitic treatment administered to the mother.

**Congenital Syphilis.**—G. K. Higoumenakis<sup>14</sup> draws attention to a new sign—namely, exostosis of the sternal end of the clavicle. He attributes it to the activation of *Sp. pallida* in the connective tissue there by friction of ends during movements of the arm. In 13 left-handed patients the abnormality was on the left clavicle. S. McLean<sup>15</sup> has made systematic radiographic studies of 102 infants with congenital syphilis and concludes that this method of examination is an accurate and sufficient method of diagnosing congenital syphilis in the first six months of life. With advancing age the radiographic evidence is of less help. E. Hoffmann<sup>16</sup> confirms Tarnowsky's work on binary syphilis in new-born infants. In a case observed by himself and Schilling an infant which died seven weeks after birth showed all the characteristic signs of congenital syphilis in bones and internal organs and at the same time had a primary sore rich in *Sp. pallida* on the scalp. He considers that cases of binary syphilis in infants are not so rare as is usually believed.

**Gastric Syphilis** (see also article GASTRIC SYPHILIS).—P. O'Leary<sup>17</sup> (Mayo Clinic) found that 89 out of 151 syphilitic patients with gastric symptoms

had gastric syphilis. In 73 per cent of the 89 the only other evidence of syphilis was a positive Wassermann reaction, and 6 per cent had negative reactions. G. B. Eusterman<sup>18</sup> (Mayo Clinic) concludes an instructive and well-illustrated paper on gastric syphilis with, amongst others, the following remark: "In all cases of syphilis in which a demonstrable gastric lesion is present, regardless of the roentgenologic type or extent, the condition should be regarded as syphilitic until it is proved otherwise." G. Evans<sup>19</sup> is also convinced that in 'latent syphilis' gastric symptoms are much more often due to syphilis of the stomach than is commonly supposed. In one of his cases syphilitic infiltrations were found about Auerbach's plexus, and there were dense perigastric adhesions; evidence of syphilis was found in other organs. He has also suggested that disturbances of oesophageal reflexes terminating in achalasia are due to the same cause. He considers it reasonable to suppose that the pathological lesions responsible for cases similar to the gastric one just mentioned "are to be sought for in the peritoneum, sub-peritoneal tissues, or sympathetic plexuses". He reports three cases of gastric dysfunction and discomfort with apparently no sign of gross lesion which resisted all forms of treatment until anti-syphilitic measures were instituted. Evans believes also that syphilis is often responsible for extensive peritoneal adhesions, and reports three cases in support. He refers to Letulle's description of chronic syphilitic peritonitis published in 1918. H. Baumecker's<sup>20</sup> summary of the symptoms suggesting syphilis of the stomach includes the following: (1) Cachexia mild in proportion to the severity of the symptoms—occasionally a palpable tumour; patient often young. (2) Chemistry of gastric juice not characteristic, but anacidity often present. (3) Radiograms show micro-gastria, rigidity, shrinking, and sometimes defective filling. (4) Gastrosocopy shows a rigid, shrunken stomach, gummata and atrophy of the mucosa.

**Syphilis and Banti's Disease.**—H. M. Korn's<sup>21</sup> reports a case of tertiary syphilis of the liver presenting all the symptoms of Banti's syndrome. In his comprehensive review of the literature on the subject he excludes 104 cases which have been reported as examples of the same kind and considers that 30 were questionable, but accepts 36. His own and these 36 indubitable cases show the importance, in any case presenting Banti's syndrome, of investigating the question of a syphilitic etiology.

**Incidence of Cardiovascular Syphilis** (*see also* HEART DISEASE, SYPHILITIC).—C. F. Coombs<sup>22</sup> in his Lumleian Lectures, which should be studied in the original, quoted some interesting figures from his own experience and that of others showing the incidence of cardiovascular syphilis. In 1750 autopsies at Bristol 354 showed cardiovascular lesions, and of these 45 were syphilitic. Dr. Cullinan's 1000 consecutive autopsies at St. Bartholomew's Hospital revealed 453 with gross cardiovascular changes, of which 33 were syphilitic. Figures from other sources ranged from 2.6 per cent to 6.0 per cent, the latter being in Glasgow. By clinical observation Coombs concludes that 5 per cent of 2047 cases of cardiovascular disease were due to syphilis, and from a consideration of his own and other figures considers that the chances of an organic lesion of the heart being syphilitic vary from 5 to 15 per cent in different parts of the world. His experience agrees with that of others in finding a heavy preponderance of males in his cases of cardiovascular syphilis, the percentage in his own being 90. The usual interval between the infection and the onset of symptoms is twenty to twenty-five years. He confirms the well-known liability of the aorta to suffer, and particularly the first part. The process often involves the mouths of the coronaries, but does not spread along them. The outlook is not good, death usually ensuing within four or five years; as the author says, no other cardiac lesion so effectively reduces the blood-supply

of the heart to an irreducible minimum, leaving no margin for emergencies. Nevertheless it is well worth while to treat thoroughly with a continuous supply of **Mercury** and **Iodide**, and two courses a year of '914' in doses not usually over 0.45 grm. and totalling 5 grm. per course. The patient must be treated thus for the rest of his life. The author emphasizes the supreme importance of preventing the great loss which his figures of incidence represent by thorough treatment of syphilis in its early stages.

**Confusion of Reinfection with Relapse.**—J. H. Stokes, H. N. Cole, J. E. Moore, P. A. O'Leary, T. Parran, and U. J. Wile,<sup>23</sup> in the course of an analysis of 5952 cases of early syphilis, show that 91.0 per cent of the mucocutaneous relapses occurred in the first two years after suspension of treatment, and 84.7 per cent in the first two years of the infection. This high percentage makes all syphilitic mucocutaneous lesions in the first two years subject to the suspicion that they are manifestations of relapse rather than of reinfection. In the series were 40 cases reported as reinfections, and 53 per cent of them were in the first two years of the first infection; in Halley and Wassermann's series of 237 cases extracted from the literature and accepted by them as probably reinfections, the percentage occurring in the first two years was 58. Further, 60 per cent of the authors' 40, and 84.6 per cent of the Halley and Wassermann series, had had inadequate treatment. The two facts suggest very strongly that a very high proportion of the reinfections which are reported in the literature are, in fact, relapses.

#### TREATMENT.

**Decomposition of Hydrargyrum ̄. Creta.**—The second report of the Pharmacy Subcommittee of the Pharmacopœia Commission<sup>24</sup> contains a note that some experiments have shown that hydrargyrum ̄. creta made according to the formula of the present Pharmacopœia rapidly develops considerable quantities of soluble mercuric chloride on keeping. The Subcommittee propose a formula which will prevent this action. [Some good authorities cannot understand on theoretical grounds how mercury in fine subdivision can be absorbed from the gastro-intestinal canal. Perhaps the explanation lies in the above discovery. If so, the prevention of the decomposition of hydrargyrum ̄. creta may have the effect of removing its active principle.—L. W. H.]

**Bismuth Treatment.**—P. J. Hanzlik, H. G. Mehrtens, D. C. Marshall, F. Watson, and J. Spaulding<sup>25</sup> have studied the conditions affecting the excretion of bismuth by human subjects. The methods tested included raising the body temperature (by baths, vaccine injections, malaria); administration of various chemicals (chloride, iodide, thiocyanate, thiosulphate, and bicarbonate of sodium, and ammonium chloride); mechanical measures to increase the muscular activity of the injected area; and increasing the intake of water. The most effective proved to be increase of intake of water, administration of chloride, iodide, and thiosulphate respectively, and increasing the muscular activity of the injected area. The authors point out the value of a knowledge of measures to increase excretion of bismuth in poisoning and to mobilize the bismuth in treatment. The simplest would be liberal drinking of water and the use of ordinary salt (at least 5 grm. a day). The experiments seem to show also the value of **Iodide** in conjunction with or following a course of bismuth. The smallest effective dose of iodide was 1 grm., which gave the largest increase in excretion.

**Choice of Bismuth Compound.**—C. Levaditi,<sup>26</sup> after nine years' experience of bismuth therapy, repeats his conviction that bismuth falls behind the arsenical preparations only in speed of action, and here the difference is only a matter of hours. On the other hand, it is safer and more lasting in its effects and often

succeeds when arsenic fails. In choosing the preparation he rules out all for intravenous injection, as well as the water-soluble preparations given intramuscularly. This leaves for consideration the water-insoluble suspensions and the fat-soluble solutions in oil. Of the first-named, he discusses the iodo-bismuthate of quinine and the oxides and oxycarbonates. The **Iodo-quinine Salts** act well but have a low bismuth content (23.85 per cent), so that they are more suitable for treatment of consolidation between intensive courses, in order to keep up the required bismuth content of the tissues. They are also useful in certain forms of visceral syphilis, e.g., aortitis, and in neurosyphilis. The **Oxycarbonate** (bismuth 81.9 per cent) superseded the hydroxide. It is injected in doses of 2 c.c. of the 10 per cent suspension every four or five days, to a total of 12 injections per course. It acts rapidly and is painless, so is suitable for treatment of all forms of syphilis. It has the disadvantage that it may accumulate at the site of injection, and therefore several courses cannot be given at short intervals. In 1924 Levaditi commenced experimentation with oil-soluble preparations, but for various reasons had to abandon the research, and, in the meantime, from 1925-7, German workers extolled the virtues of a number of preparations of this class. Levaditi has studied in animals the  $\alpha$  carboxethyl  $\beta$  methyl nonoate of bismuth (biliposol, bivitol). [Also, as shown in other papers, the camphor-carboxylate, sold in this country as 'cardyl', which gave similar results.—L. W. H.] The ratio of curative to maximal tolerated dose ( $\frac{C}{T}$ ) worked out at  $\frac{1}{12.5}$ , the curative

dose of bismuth metal in this combination being between 1 and 2 mgrm. per kilo. of animal—that is, far lower than the dose when the metal is given in the water-insoluble form. **Biliposol** contains 0.04 grm. of bismuth per cubic centimetre and is given in doses of 2 c.c. twice weekly in courses of 10 to 15 injections. Excretion commences in three hours and continues after termination of the course for as long as one and a half to two months. The lipo-soluble preparations of bismuth seem therefore to constitute the happy medium between the too rapidly absorbed and often painful water-soluble preparations and the water-insoluble suspensions, which are more slowly absorbed, more difficult to measure (on account of the settling out of the compound), and may possibly accumulate too much at the sites of injection.

A. Schwartz,<sup>27</sup> who was associated with the late Dr. Fournier at the Hôpital Cochin in clinical collaboration with Levaditi, sums up the experience of the various bismuth compounds with enthusiastic praise of the lipo-soluble, which have been tested since 1927. He sees in them a complete treatment of syphilis and would employ them exclusively in almost every case. He mentions the use of **Naphthenate (Embial)** in Germany, and three—namely, **Bivitol**, the **Methyl-hydrocinnamate (Biazan)**, and the **Camphor-carboxylate (Cardyl)** tried at the Hôpital Cochin. The effects of all seem to be about equal. For early cases he recommends a first series of 12 injections of 2 c.c. (0.08 grm. of bismuth), 3 injections the first week and 2 a week afterwards; one month's interval; second series of 12; interval one month; third series of 12; interval of three months; followed for a number of years by two series a year. In early cases the serum reactions were negative in 80 per cent of cases a month after the first course, and in practically all the remainder by the end of the second. The author quotes reports similarly favourable to the lipo-soluble compounds by C. Simon and Bralez, by M. Pinard, and by Georgevitch. [Other reports in the literature are to the same effect, and it seems likely that there will be a consensus of opinion in favour of the use of the lipo-soluble compounds (of which there are now a number on the market) in all cases where the patient can attend twice weekly. So far as my experience goes, it is very

favourable, and I would prefer the lipo-soluble compounds in most cases, though the frequency of the injections which their use entails involves an important increase in labour. Where only one attendance is practicable an insoluble compound is necessary. In this case one such as the oxychloride suspended in a watery medium seems preferable to the hydroxide or oxycarbonate suspended in oil, especially as Lomholt has shown that suspensions in oil are more slowly absorbed than are those in water.—L. W. H.]

#### **Arsenobenzene Treatment.**—

*Relation of Arsenobenzene Treatment to Late Effects of Syphilis.*—It has been asserted by a certain number of authorities that, although (perhaps because) arsenobenzene treatment rapidly eliminates external lesions, it favours the development of late ones in the form of parenchymatous neurosyphilis, cardiovascular syphilis, etc. This view has been contested repeatedly and good evidence produced against it, but it is still repeated. The following may help to destroy it finally. M. Jessner and N. Rossiansky<sup>28</sup> headed a German-Russian Expedition to the Buryat-Mongol Republic near Lake Baikal, Siberia, where the population is largely untreated. In 422 syphilitics they found aortitis just as common as is calculated for Germany. Lumbar puncture of 400 patients showed that 33 were definitely suffering from parenchymatous neurosyphilis and 29 of them had previously received no treatment. Besides these were 25 cases of meningo-vascular syphilis. J. F. Madden<sup>29</sup> investigated 500 cases of late syphilis, including 415 with neurosyphilis, with reference to their earlier treatment. Only 2 of the 500 had received anything like energetic treatment in the first year. Of these two, one had had fifteen injections of '914' plus an unknown number of mercurial injections, and the other "an unknown number of intravenous and intramuscular injections of an unknown drug". Similar evidence is given by E. Gottlieb and N. J. Nissen,<sup>30</sup> who found that, of 87 patients with late syphilitic lesions, only 2 had been treated with salvarsan in the earlier stages; the remainder had received no treatment at all or a most inadequate amount of mercury. In 31 observed for not less than ten years, during which they had shown no sign, no fewer than 16 had been treated in the early stages with salvarsan.

A. Savulesco<sup>31</sup> states that the solution of '914' in the chologogue **Dehydrocholate of Soda** (5 c.c. of a 20 per cent solution) prevents toxic effects, and by this means he is able to give as much as 5 to 6 gm. '914' in from two to three weeks. [Experience of the method at the St. Thomas's Hospital V.I. Department seems to show that it does help the tolerance of '914', but when a patient treated first with '914' dissolved in water shows urobilinogen in his urine continuance of the treatment with the '914' dissolved in dehydrocholate of soda does not prevent the subsequent development of jaundice.—L. W. H.]

*Arsenobenzene Jaundice.*—E. B. Craven, jun.,<sup>32</sup> has reported a number of experiments on dogs which, if applicable to man, show the great importance of **Diet** in the prevention of arsenobenzene jaundice. They show, moreover, that we have been wrong in restricting fats and advising plenty of carbohydrates. Of 30 dogs, 10 each were fed on a high carbohydrate, a high fat, and a high protein diet, and '606' was injected into each in equivalent amounts, according to weights of the animals. At autopsy carbohydrate-fed animals were found to have extreme liver necrosis in 4, marked in 5, and moderate in 1. The 10 protein-fed dogs had moderate necrosis in 3 and slight in 3, while the 10 fat-fed showed frank necrosis in only 1, while another showed microscopically a slight collapse of one lobule as if some liver cells had been killed and removed. The marked necrosis in the one fat-fed animal was attributed to starvation, for animals were apt to refuse such a fatty diet as was served to this series. Craven showed that starvation is a very important predisposer to liver



damage by arsenobenzene compounds. [This work seems to explain much that was puzzling about arsenobenzene jaundice. For example, certain epidemics of it which occurred in military V.D. hospitals towards the end of the War, without change of dosage, may have been due to the low fat-content of the food available at that time. Also the seasonal variation of this jaundice may be explained on the same lines, as well as the fact that it is a rarity in private patients, who commonly eat much more fat than do the poorer clinic patients. The starvation factor may influence the hour of the day at which it is advisable to give the injection. Patients attending some clinics may receive their injections many hours after the last square meal, and it may be advisable to recommend patients to have their injections about two hours after a good meal.—L. W. H.]

**Shock.**—In instances of severe shock attending injections of '606' or '914' F. Wirz<sup>33</sup> strongly recommends putting the patient into a **Hot Bath**. In a fatal case of the kind injections of various restoratives had completely failed, and the author was led by this to try the hot-bath method in the next case. Recovery began in half a minute, and this experience has been repeated in eight similar cases; some of these were very serious and some of the patients even unconscious.

**Routine Treatment.**—L. W. Harrison<sup>34</sup> states his belief that under-treatment of early cases may easily be responsible for the fact that the incidence of syphilis has been stationary in this and other countries since about 1925. Under-treatment leaves the patient to relapse with latent syphilis so that there are no external lesions to remind him that he is contagious. On the basis of experience, including analysis of results obtained by different amounts of treatment, he recommends for cases which have become sero-positive three courses of **Arsenobenzene and Bismuth** beyond that which ends with negative serum reactions. He insists on the importance in early cases of giving bismuth from the first, believing on the strength of evidence from different sources that the exclusive use of arsenobenzene compounds in the early weeks of treatment favours the settlement of *Sp. pallida* in the central nervous system.

E. T. Burke<sup>35</sup> strongly contests this view. He does not accept the evidence that the exclusive use of arsenobenzene in the early weeks favours the incidence of neurosyphilis, and, on the other hand, contends that the concurrent system favours the development of Wassermann-fastness. He has elaborated a method of treatment<sup>36</sup> in which treatment commences with **Stabilarsan** given weekly for six weeks. There are three such courses, and in each of the two-monthly intervals which separate them a lipo-soluble compound of **Bismuth** is given twice weekly. By this means the treatment is completed in a much shorter time than under Harrison's schedules, namely, twenty-six weeks, a great advantage from the point of view of maintaining the patient's attendance until completion.

The publication of these diverse views led to correspondence in the *Lancet* by L. W. Harrison, H. Allen, D. Legs, E. T. Burke, H. D. Spence, and J. H. Sequeira<sup>37</sup> which left the question open. [The details of the different treatments advocated in these articles and of the arguments advanced in the ensuing controversy by the authors mentioned cannot with justice be summarized in the space available here, and the reader is advised to consult the originals.—L. W. H.]

E. Hoffmann<sup>38</sup> stresses the importance in early cases of giving a sufficient weekly dose. He considers that an average man should have 1.2 gm. '914' and a woman 0.9 gm. This is given in two doses (0.6 or 0.45), and concurrently with each dose of '914' from 1.0 to 1.5 c.c. of **Bismogenol** is injected. A course

on these lines lasts five to six weeks and is followed by another after an interval of the same length. In secondary syphilis three such courses are given. The observation after suspension of treatment is three years in primary cases and four to five years in secondary.

REFERENCES.—<sup>1</sup>*Münch. med. Woch.* 1931, lxxviii, 1125; <sup>2</sup>*League of Nations Health Organization Report of the Laboratory Conference on the Serodiagnosis of Syphilis*; <sup>3</sup>*U. S. Treasury Department Public Health Reports of the United States Public Health Service*, 1931, April 24, xlvii, No. 17; <sup>4</sup>*Arch. f. Dermatol. u. Syph.* 1930, clxii, 102; <sup>5</sup>*Deut. med. Woch.* 1930, Aug. 29, 1474; <sup>6</sup>*Wien. klin. Woch.* 1931, xlv, 1069, 1102; <sup>7</sup>*Deut. med. Woch.* 1931, May 1, 749; <sup>8</sup>*Jour. Amer. Med. Assoc.* 1930, Nov. 29, 1637; <sup>9</sup>*Med. Jour. and Record*, 1930, Aug. 6, 136; <sup>10</sup>*Ven. Dis. Information*, 1930, xi, 203; <sup>11</sup>*Beitr. Geburtsh. Gynäkol.* 1913, xviii, 201; <sup>12</sup>*Canad. Med. Assoc.* 1930, July, 48; <sup>13</sup>*Wien. klin. Woch.* 1931, Jan. 9, 51; <sup>14</sup>*Deut. Zeits. f. Nervenhlk.* 1930, Sept., 288; <sup>15</sup>*Amer. Jour. Dis. Child.* 1931, xli, 1411; <sup>16</sup>*Geneesk. Tijds. v. Nederl.-Indië* 1930, July 1, 674; <sup>17</sup>*Amer. Jour. Surg.* 1931, Feb., 286; <sup>18</sup>*Jour. Amer. Med. Assoc.* 1931, Jan. 17, 173; <sup>19</sup>*Practitioner*, 1931, Feb., 205; <sup>20</sup>*Med. Klin.* 1930, Oct. 17, 1557; <sup>21</sup>*Amer. Jour. Med. Sci.* 1930, clxxix, 811; <sup>22</sup>*Lancet*, 1930, ii, 227, 281, 333; <sup>23</sup>*Ven. Dis. Information*, 1931, xii, 55; <sup>24</sup>*General Medical Council Pharmacopoeia Commission, Reports of Subcommittees*, 1931, No. 6; <sup>25</sup>*Arch. of Dermatol. and Syph.* 1930, Dec., 994; <sup>26</sup>*Amer. Jour. Syph.* 1930, xiv, 156; <sup>27</sup>*Presse méd.* 1931, June 3, 80, and *Annal. de l'Inst. Pasteur*, 1930, xlv, 386; <sup>28</sup>*Arch. f. Dermatol. u. Syph.* 1930, May 27, 224; <sup>29</sup>*Amer. Jour. Syph.* 1930, xiv, 451; <sup>30</sup>*Ugeskr. f. Laeger*, 1930, Nov. 6, 1039; <sup>31</sup>*Bull. Soc. méd. Hôp. de Bucarest*, 1930, xii, 220; <sup>32</sup>*Bull. Johns Hopkins Hosp.* 1931, March, 131; <sup>33</sup>*Münch. med. Woch.* 1930, July 13, 1225; <sup>34</sup>*Practitioner*, 1931, Feb., 193; <sup>35</sup>*Lancet*, 1931, i, 1127; <sup>36</sup>*Amer. Jour. Syph.* 1931, April, 155; <sup>37</sup>*Brit. Med. Jour.* 1931, i, 306; <sup>38</sup>*Lancet*, 1931, i, 1265, 1322; ii, 374; <sup>39</sup>*Geneesk. Tijds. u. Nederl.-Indië*, 1930, July 1, 674.

**TABES DORSALIS.** (See OPTIC ATROPHY; SYMPATHETIC NERVOUS SYSTEM, SURGERY OF; SYPHILIS.)

**TACHYCARDIA.** (See ARRHYTHMIA AND ELECTROCARDIOGRAPHY.)

**TAPEWORMS.** (See WORMS, INTESTINAL.)

**TEETH, PAIN IN.** (See DENTAL PAIN.)

**TEETH, PULPLESS: THE PROBLEM OF.**

L. E. Claremont, M.D.S., M.R.C.S., L.R.C.P.

Considerable controversy continues to rage round this subject. In view of the increasing importance the physician places on the part played by foci of infection, it may be helpful to analyse the situation as it is presented to-day. There appear to be three main views, the ultra-radical, the ultra-conservative, and lastly the rationally conservative.

The ultra-radical hold the view that all pulpless teeth are a potential menace and should invariably be removed. The ultra-conservative consider the pulp is non-essential for the well-being of the tooth, and the septic canals can be rendered innocuous by therapeutic and surgical means. The third group—namely, the rationally-conservative—are gaining ground in many quarters, the appropriate treatment being guided by the merits of each individual case—that is, whether the tooth in question is temporary or permanent, its position in the arch, the degree of infection, the condition of the periodontal membrane and peri-apical tissues, and last, though by no means least, the systemic condition of the patient.

To my mind there are two outstanding factors that should influence one in advising the removal of dead teeth: (1) The patient's general condition. (2) The degree of tooth infection. In this connection it is of vital importance to recognize three types: (a) A septic pulp canal with healthy peri-apical tissues; (b) Infection of the canal and also the area round the apex; (c) Peri-apical infection with establishment of a sinus.

With regard to general symptoms suggestive of a chronic toxæmia, there is much evidence to prove the advisability of an extraction in every case. On the other hand, many medical men and dental surgeons are bound to admit their results are often disappointing. Rosenow, of the Mayo Clinic, as a result of his various experiments, states "not too much should be expected from the removal of a focus, especially in chronic conditions, because a similar condition may be present in inaccessible foci and in others too small to be detected." Recovery may be made difficult by local tissue sensitivity, and living bacteria in a secondary metastatic lesion may continue the process independently of the primary focal source.

The predominating organism found in apical infections is streptococcal—the *Str. viridans* being the commonest. These organisms adapt themselves to the changes of oxygen tension present, becoming facultative anaerobes. Meissner has shown that virulence of a streptococcus existing round the apex of a pulpless tooth is much greater than that isolated from the mucous membrane of the mouth. In order to deal more efficiently with the metastatic condition it would appear desirable to administer guarded doses of an autogenous **Vaccine** taken from a focus, and given after its removal.

In opposition to these views it will be noted that patients showing systemic disease do not always carry demonstrable foci. Broderick considers that lack of endocrine balance and calcium deficiency is the important and underlying factor in focal infection of dental origin—in a word, the origin of sepsis lies in a lack of the defensive power of the body rather than in the bacteriology of the condition—that is, the primary sepsis and the systemic state are due to the same underlying general lack of resistance of the body to infection. One may have some proof of this suggestion in pernicious anæmia. Here dental sepsis is frequently present, and until the advent of treatment by liver extract all the teeth were automatically condemned.

However one may be impressed with the suggestion that deficient resistance rather than bacterial infection is the underlying cause, we are all familiar clinically with certain startling results and a complete return to health on removal of certain infected and pulpless teeth. It is rational, therefore, to assume that if a patient presents serious general symptoms for which no obvious cause can be found, every possible infective focus, including pulpless teeth, must be eliminated.

It is frequently very difficult to know whether a tooth is the seat of infection or not. X-ray pictures are often misleading. Rosenow, Price, and others have found that where the radiograph shows an apparently normal condition the tooth apices give bacterial cultures as frequently as those with large rarefied areas. Transillumination of the alveolar process has the same pitfalls. To be absolutely sure of one's ground it is necessary to carry out bacteriological and biological tests. A test similar to the 'Schick' may be employed, whereby cultures are taken from the infected area and suspended in saline. Using sterile saline as a control, a series of inoculations are carried out. By noting the skin reaction, there is some indication whether the organisms used in the test are causing the systemic symptoms or whether they are due to some other focus. Gottlieb's biological control is carried out on rats. He finds that if a healthy tooth apex is implanted into the rat a histological section shows no infection in the connective tissue, and the pulp tissue in the apex of the tooth becomes organized and replaced by the connective tissue of the rat. On the other hand, if the implanted tooth is infected, there is a marked cellular infiltration into the rat's connective tissue, sometimes passing on to pus formation and necrosis.

Turning now to the type of tooth infection, I have always stressed the

importance of trying to assess the type. From a purely dental point of view one recognizes four types of dead teeth: (1) Teeth that have been artificially devitalized. (2) Teeth with putrefactive material in the pulp canals. (3) Teeth where the septic material has passed from the pulp canal into the peri-apical tissues. (4) Where the exudate has found an outlet to the surface usually through the outer alveolar plate. Let us briefly consider each of these conditions.

It has been stated that it is impossible to carry out aseptic dental surgery. If a tooth is to be devitalized artificially every possible precaution must be taken to try for the ideal. Isolation with rubber dam, careful rubbing of the surface of the tooth with a strong germicide such as tricresol, removing the pulp with a pool of tricresol in the pulp chamber, and lastly using sterile instruments, should render it impossible to grow cultures from the tooth surface or its pulp canal. The causation of infection in teeth can be grouped under bacterial, chemical, and traumatic.

Bacterial infection of the pulp canal at the time of operation does very frequently occur if the strictest care is not taken.

Drugs or chemicals such as arsenic used in devitalizing a pulp may do irreparable damage to the peri-apical area by destroying the tissue and thus rendering it much more susceptible to bacterial invasion.

Trauma of the peri-apical area is very easily brought about by forcing fine instruments used in removing the pulp through the apex.

In order to avoid any of these accidents it would appear desirable to remove pulps under interosseous or block injection with careful instrumentation and isolation of the tooth as indicated above.

The question whether a canal so treated should be filled or not is still a subject for much discussion. If a filling is used, it must of course be sterile and preferably possess a mild non-irritating antiseptic property. Certain practitioners obtain absolute dryness, preferably with a cautery, and do not fill as far as the apex. Others only fill the pulp chamber, leaving the canals quite empty.

There are undoubtedly a great number of teeth treated on the lines I have indicated that give no after-trouble and appear to show no apical changes later on.

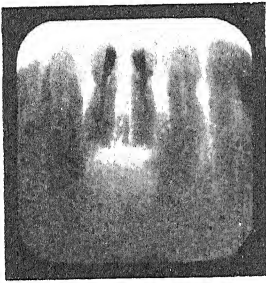
If it is decided to save any form of septic tooth, the agents employed to attempt this can be grouped under the following headings: (1) Chemical; (2) Bacterial; (3) Electrical; (4) Surgical.

It will of course be readily understood the most favourable type is that where, as far as it is possible to judge, the sepsis is confined to the canal, the peri-apical tissues being intact. In this type of case it is of the utmost importance to render the contents of the canal sterile before attempting their removal. Any clumsy instrumentation or pressure in the canal will push the infection through the foramen, with the usual serious consequences. Among the chemicals that have been tried one mentions tricresol, formalin, paraform, the aniline dyes, such as proflavine, and the chlorine-liberating group such as dichloramine-T.

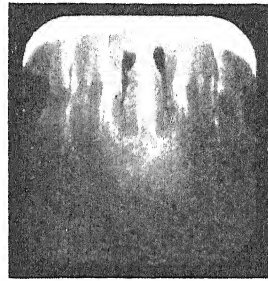
Lastly, I mention a deposition method devised by Howe, of Boston, whereby silver is precipitated from an ammoniacal solution of silver nitrate by means of formalin or eugenol. Here formalin and silver are both antiseptic. In addition the solution has the unique property of not only penetrating the frequently tortuous canals but also the diseased dentinal tubules, which are sterilized and then occluded by the precipitate. Sound dentine is not entered, as it contains a colloid which coagulates or forms a surface silver albuminate. It has been shown that when teeth treated by this method were extracted six

*PLATE LXII*

APICOECTOMY AND APICAL CURETTAGE



*Fig. A.*--Condition immediately after apices had been removed.



*Fig. B.*--Condition six months after operation.



months later, adequately controlled bacteriological investigation showed them to be sterile. This suggests a certain degree of permanency.

Bacterial sterilization has been carried out by Moxon. He inoculates the septic canals with living cultures of *Bacillus Bulgaricus*—a constant and non-pathogenic organism of the body. He claims canals were rendered sterile in twenty-four to forty-eight hours, the only organism left being *B. bulgaricus*. The treatment of teeth with large areas of apical rarefaction is successful, there being radiographic evidence of well-marked osteogenetic repair.

Wilkinson has recently been experimenting with a proteolytic enzyme—**Papain**. This digests out the necrotic pulp remnants in seven days. The inflammatory reaction in the peri-apical tissues readily responds to anti-septic treatment.

Electrical sterilization—**Ionization** with a dilute solution of zinc chloride and silver nitrate—is useful. Ultra-violet radiation has also been attempted.

Under surgical methods one refers to the operation of **Apicoectomy and Apical Curettage**. This method is adopted when sufficient draining of peri-apical infection cannot be procured via the canals. The field is limited, as it is not feasible to attempt the operation on multi-rooted teeth, and also where the periodontal membrane and the alveolar bone have been damaged for more than a quarter of the distance from the apex up the side of the root. Provided the root canal has been soundly filled and at the time of the operation silver nitrate by the Howe method is applied to the end of the root after amputation of the apex, the results are very encouraging. X-ray pictures taken six months or more after show a definite filling up of the bony cavity with newly calcified tissue. (See Plate LXII.)

To sum up, the position adopted by the rationally conservative group is as follows :—

1. It is justifiable in a very great number of patients whose systemic condition is good and who are not over 45 years of age, to devitalize artificially where the alternative would be an extraction. The procedure adopted must in all cases be carried out as aseptically as possible. Teeth treated in this way should be carefully inspected, and if necessary X-rayed from time to time. If at any subsequent period the patient's medical adviser considers the mouth is the source of the mischief, the dead teeth can be removed.

2. Bearing in mind a sound systemic condition and the 45-year age limit, it is probably justifiable to treat dead teeth thoroughly where, as far as one can estimate, there is no infection of the peri-apical tissues.

3. Where peri-apical infection is definitely established, it might be helpful to all concerned for the dental surgeon to consult the patient's medical adviser if conservation treatment is to be considered. Speaking generally, the modern dental surgeon rarely attempts to save this type of tooth if it has more than one root. It would appear desirable to make every possible effort to retain, and thus save, an incisor tooth, more particularly in the maxilla, if it is the only tooth with peri-apical disease in a young healthy adult, especially of the female sex.

I have previously pointed out there are a number of procedures now available for attempting to render the apex of a tooth and its immediate neighbourhood free from organisms. Surgical apicoectomy and curettage is gaining ground as being one of the most likely methods for affecting a cure, but the operation is only practicable in the front of the mouth.

4. All molars and perhaps the maxillary first bicuspid should be removed where the peri-apical tissue is infected.

REFERENCE.—“The Pulpless Tooth”, *Jour. Med. Assoc. S. Africa*, 1930, Sept. 27, 551.

**TENOSYNOVITIS.** (See HAND AND ARM, INFECTIONS OF.)**TESTIS, DISEASES OF.**

Sir John Thomson-Walker, F.R.C.S.

Discussing the diagnosis of *tuberculosis of the genital tract* on the basis of an analysis of 184 cases of genito-urinary tuberculosis, J. D. Barney, J. L. Watson, and S. Elliott<sup>1</sup> state that the diagnosis of tuberculous epididymitis is indicated by induration, enlargement, and nodulation of the organ involving especially the lower pole, with little pain or tenderness, the corresponding vas deferens is thickened and nodular, and the presence of a healed or active sinus is important. A hydrocele may be present and necessitate tapping for diagnosis. In many cases the diagnosis is difficult, and the writers advocate exploration under local anaesthesia when doubt exists. Hinman performs epididymectomy first and then has an immediate pathological examination made before proceeding to removal of the vesicles. The diagnosis of a scrotal condition cannot be regarded as complete without careful rectal examination. The treatment will depend largely upon what the surgeon believes to be the primary focus of the disease. If it is thought that the prostate and seminal vesicles are the site of origin of the disease, radical surgery which removes the greater part or the whole of the genital tract will be advocated. If, on the other hand, he believes that it begins in the epididymis he will advocate conservative surgical measures such as epididymo-vasectomy, or in the few cases where the testicle has been attacked, orchidectomy. In either case, the patient should be regarded by the surgeon as a case of tuberculosis with a local manifestation, and will therefore be given hygienic heliotherapy and tuberculin treatment.

H. A. Johnson<sup>2</sup> records 2 recent cases of *torsion of the spermatic cord with strangulation of the testis*, and briefly reviews 4 previous personal cases. In 5 of the cases rotation occurred from without inwards, and in only 1 was it from within outwards. The normal testicle cannot become rotated because of the firm attachment of the epididymis to the posterior scrotal wall. There must be mobility, with no attachment of the epididymis and probably intra-vaginal lengthening of the cord. Given these conditions rotation may take place at any time, and it is quite probable that the involuntary contractions of the cremaster muscle play an important part in the process. In the 6 cases mentioned, the ages varying from 17 to 28 years, 3 occurred during sleep, 1 after coitus, 1 after violent muscular effort, viz., jumping off a truck, and the last after lifting a heavy piece of machinery above the head.

C. S. Swan<sup>3</sup> analyses 90 cases of *epididymitis* subjected to **Epididymotomy**. In 70 the condition was due to gonorrhoea, in 14 it was non-gonococcal, and in 6 it was doubtful. If the epididymitis is severe enough to necessitate the patient's being sent to bed, and if after two or three days' rest the symptoms progress, the writer recommends epididymotomy, because in a high percentage of cases this will lead to almost immediate and permanent relief of pain, quick fall of temperature, less loss of time from duty, the removal of what may be a focus keeping up infection in other genital structures, less risk of recurrence, and, finally, less likelihood of subsequent sterility.

REFERENCES.—<sup>1</sup>*Amer. Jour. Surg.* 1930, Oct., 84; <sup>2</sup>*New Eng. Jour. Med.* 1931, April 30, 899; <sup>3</sup>*Ibid.* 1930, Sept. 25, 631.

**TESTIS, UNDESCENDED.**

John Fraser, Ch.M., F.R.C.S.Ed.

While the mechanism of delayed descent of the testis has been accurately worked out, the actual cause of the error remains obscure. The interstitial cells of Leydig are apparently little affected, and to this fact must be attributed the relative infrequency of gross alterations in the sexual character.



## PLATE LXIII

### UNDESCENDED TESTIS

(A. GOETSCHE)



Boy, aged fourteen. Bilateral undescended testes. Stigmata of degeneration: bilateral ptosis, left internal strabismus, large ears, thick lips, feathered nose, etc.

*By kind permission of the  
'American Journal of Surgery'*



P. Frühmann and H. Sternberg<sup>1</sup> investigated the bodily and mental characteristics of individuals with undescended testis; they conclude that the changes co-incident with puberty, especially change of voice, are delayed in double-sided cryptorchids, but that they eventually appear and develop. In a series of cryptorchid adults the body hair was absent in 40 per cent; in 20 per cent the pubic hair had a feminine distribution; aspermatogenesis was usual, but not invariable. There is no doubt, however, that in certain cases marked stigmata of degeneration are found in association with undescended testis, and the illustration from a paper by A. Goetsch<sup>2</sup> here reproduced (*Plate LXIII*) is a vivid demonstration of this. The most important of the other complications of retained testis are hernia and hydrocele, and torsion of the spermatic cord; Goetsch disputes the belief that malignancy is more prone to arise in a retained testis, and in this he is supported by the Viennese workers quoted above.

E. J. Donovan<sup>3</sup> notes some interesting features in relation to torsion of the cord in babies; if the torsion is not relieved within thirty hours, the testis becomes completely necrosed and the epididymis shortly afterwards follows suit. The whole process is striking in that in the majority of published cases symptoms have been slight or absent, and the whole illness afebrile, its differentiation from hernia being thus rendered extremely difficult. Donovan urges that, should the testicular circulation not visibly improve after the application of a series of hot pads, the organ should be excised, as the danger of subsequent infection is very great.

#### OPERATIVE TREATMENT.—

Recent communications are unanimous in stressing the importance of thoroughly mobilizing the spermatic cord to augment its available length. If this is not well done, retraction of the replaced testis is almost sure to occur. It is usually believed that the greatest barrier to mobilization is the relative shortness of the spermatic vessels, the ductus

deferens itself being more or less of normal length. If necessary, the spermatic veins may be divided without harm, but the spermatic artery should if possible be conserved. Bevan originally warned us against the indiscriminate ligation of the artery, and J. Petrivalsky<sup>4</sup> reports two cases in which it was followed by complete necrosis of the testis.

Hernia is an almost constant accompaniment of retained testis, and that the adequate treatment of the hernial sac may have an important bearing on the replacement of the testis is urged by Goetsch. The sac should be ligated as near the abdominal ring as possible; in obstinate cases Goetsch supplements this by stripping the ductus and the other components of the spermatic cord extra-peritoneally.

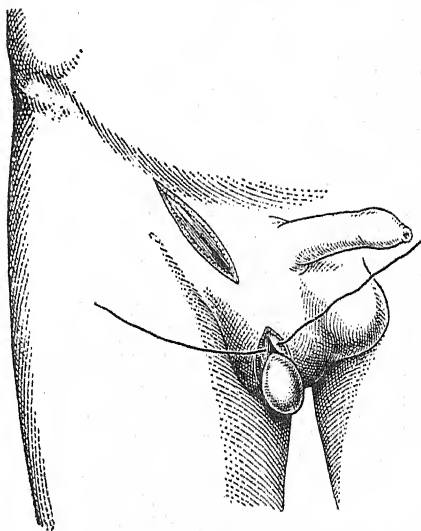


Fig. 106.—Showing the testicle pulled outside the scrotum and a catgut stitch passed through the dartos, diminishing the size of the wound and preventing the testicle being drawn up. (By kind permission of 'La Presse médicale'.)

Petrivsky recommends an ingenious method of overcoming excessive traction on the cord. He is opposed to those methods which grossly interfere with the spermatic vessels; instead, he frees the testicle and cord as far as possible, divides the fine connective tissue which unites the testis and epididymis, and, if necessary, divides the inner margin of the abdominal ring, when gentle traction on the testis will cause the end to slip into the medial part of the enlarged ring; indeed, the incision in the fascia transversalis can be prolonged until the cord overlies the pubis. The incarceration of the released organ in the scrotum is secured by laying it between the skin and the dartos layer at the inferior pole of the scrotum, the testis being pulled into this situation from the interior of the scrotum through a small incision in the dartos.

J. Schoemaker<sup>3</sup> trusts to the ordinary methods of liberation, but also urges the imprisonment of the testis between the skin and dartos (*Fig. 106*).

REFERENCES.—<sup>1</sup>*Arch. f. klin. Chir.* 1930, July, 633; <sup>2</sup>*Amer. Jour. Surg.* 1931, April, 63; <sup>3</sup>*Ann. of Surg.* 1930, Sept., 405; <sup>4</sup>*Zentralb. f. Chir.* 1931, April 18, 1001; <sup>5</sup>*Presse méd.* 1931, Jan. 21, 99.

### THROMBOPHLEBITIS MIGRANS.

A. G. Gibson, M.D., F.R.C.P.

J. A. Ryle<sup>1</sup> records 5 cases of thrombophlebitis migrans. The disease usually starts in the superficial peripheral veins with symptoms of inflammation. Small vascular obstructions occur in the lungs, abdomen, and, more rarely, in the heart and brain. It tends to run a long and interrupted course, with some fever and leucocytosis at each fresh development. The prognosis is favourable because the thromboses are venous, they do not spread to other trunks, and there is no septicæmia. Pulmonary thromboses may give pleuritic symptoms preceding hæmoptysis and the effusion of hæmorrhagic fluid. The treatment is expectant and symptomatic. Obvious focal infections should be attended to. It affects both sexes, and the first case recorded is a young man of 23 years.

REFERENCE.—<sup>1</sup>*Lancet*, 1930, ii, 731.

### THROMBOSIS, POST-OPERATIVE. (See POST-OPERATIVE COMPLICATIONS.)

### THYMOPHYSIN IN OBSTETRICS. (See LABOUR AND ITS COMPLICATIONS.)

### THYMUS IN CHILDREN.

Reginald Miller, M.D., F.R.C.P.

Perhaps there is no more remarkable difference in the pædiatric literature on the two sides of the Atlantic than is exemplified in the matter of the thymus and its significance in the diseases of children. In the United States and in Canada there has been of recent years a large amount published dealing in terms of great enthusiasm with diseases due to the thymus, their diagnosis and extraordinarily successful treatment. It is, however, probably true to say that but little of this has received the imprimatur of the more authoritative leaders in pædiatrics on the other side. In England we have almost confined ourselves to thymic asthma as a great rarity, and status lymphaticus as a 'mystery disease' dear to news sub-editors; though a few attempts have been made to find a therapeutic use for thymus administration.

As there are now signs that some American writers are beginning to appreciate the difficulty in accepting much of what has been expressed in their literature on this subject, it may be of interest to note some recent opinions on the importance and frequency of thymic disorders as given in recent American papers. It will certainly be instructive, some day in the future, to look back and see to what extent these seemingly extreme views have impressed themselves on English pædiatricians.

A. S. Kirkland,<sup>1</sup> for instance, writing as a radiologist, regards morbid conditions due to enlarged thymus as common, their diagnosis by skiagrams comparatively sure, and their treatment brilliantly successful. He quotes with full approval such views of other authors as the two following: "If the symptoms of thymic asthma are present, even if the X-ray of the chest shows no thymus shadow, nevertheless, radiation should be given"; and "If there is one real specific in pædiatric medicine, I feel that it is the radiation treatment of thymic disease."

Now, as has been mentioned already, there seems to be a widespread reaction against such enthusiastic views, and several papers, some of them of considerable length and showing a tendency to reconsider the whole problem afresh, have recently appeared. Examples of the view of three authors will suffice. J. H. West,<sup>2</sup> for instance, writes: "It has of late been quite the vogue to attribute many of the ailments of infancy and young children to the thymus. All sorts of respiratory sounds, varying from a slight rattle in the throat to asthmatic breathing, have been considered thymic. Even colic with slight cyanosis has been associated with the same etiology . . ." He goes on to point out forcibly that the identical condition of the thymus alleged to produce such symptoms is often found in autopsies on small children who have presented no symptoms attributable to the thymus. He also quotes Helmholtz as stating that in seventeen years he had seen no case of stridor which he felt was due to thymic enlargement. West himself is of opinion that stridor is a rare consequence of such a condition, and that thymic enlargement is more commonly associated with causeless attacks of cyanosis, apnoea, and limpness. L. J. Kennedy and G. B. New<sup>3</sup> go rather further, and are of opinion that it is often quite erroneous to attribute chronic stridor to enlargement of the thymus, and mention several cases diagnosed as such and yet entirely unrelieved by X-ray treatment. Lastly, H. K. Pancoast,<sup>4</sup> in a lengthy study of the subject from a radiologist's point of view, is still more emphatic in warning against a too facile diagnosis of thymic enlargement. He gives as the only two reliable signs of obstruction due to the thymus: (1) Narrowing or buckling of the trachea at the thoracic inlet that can only be appreciated by a lateral skiagram of the parts; and (2) Lateral deviation of the trachea in the sagittal view. Enlargement of the thymus, if by that is meant abnormal width of the thymus shadow, he regards as of no particular significance.

**Status Lymphaticus.**—If there is any tendency for us on this side to think that Canadians and American authors have gone too far in their enthusiasm for thymic asthma, it is more than possible that they find themselves in the same position in criticizing our past acceptance of the condition known as status lymphaticus. This, although never received very wholeheartedly by clinical pædiatrists in this country, has become rather dear to the hearts of some pathologists and those concerned with medico-legal work. The view that has been put forward is to the effect that certain children, and even adults, who show post mortem enlargement of the thymus and over-activity of the lymphatic structures in the spleen and elsewhere in the body, are apt to die suddenly from some cause seemingly too trivial to account for death in normal subjects.

The chief rôle filled by status lymphaticus has been to account for death occurring during operations, often of a trivial type, and such has been its success that the possibility of death arising from an over-dose of anæsthetic has been almost abolished from the otherwise none-too-happy lot of anæsthetists in recent years. Clinicians, however, have never felt very comfortable in accepting these doctrines, for, to deal only with children, it has been difficult for them not to notice that a very similar condition appeared to be practically constant in any small child who has died suddenly from any cause before

wasting has appeared. There seemed, for instance, remarkably little difference in the post-mortem appearances of a well-nourished child killed by some fatal accident and one who has died unexpectedly during an operation for acute appendicitis. In other words, it seemed possible that the condition of so-called status lymphaticus was a normal state in a well-nourished small child, and that status lymphaticus is found post mortem because the child has died suddenly, rather than that the child died suddenly because it had status lymphaticus. These conflicting views have existed side by side, and for some reason or other the question has never been very actively thrashed out.

During the current year a report has been published<sup>5</sup> of a committee formed to investigate the subject of status lymphaticus by the Medical Research Council and the Pathological Society of Great Britain and Ireland acting together. This committee has been at work ever since January, 1926, and inherited some of the material of a previous committee which had published an interim report<sup>6</sup> during the previous year. The committee has come to the conclusion that there is no real evidence that the so-called status thymico-lymphaticus has any existence as a pathological entity. If this is true, it appears, as is stated in a *Lancet* editorial<sup>7</sup> on 'the end of status lymphaticus', "that we have to accept the fact that a few people, especially children, die when we cannot see why they should. If there is an inherent constitutional vice in some persons which makes their response to an anæsthetic dangerous to life, it is certainly not represented by the state of their thymus and lymphatic glands. The personal defect may be discoverable: on the other hand, it may not exist. Children have had far less opportunities than adults of training themselves to meet the changes and chances of life; perhaps it is natural that their bodies should stop working more easily."

REFERENCES.—<sup>1</sup>*Canad. Med. Assoc. Jour.* 1930, Nov., 661; <sup>2</sup>*Arch. of Pediatrics*, 1930, Nov., 671; *Med. Press and Circ.* 1930, Dec., 538; <sup>3</sup>*Jour. Amer. Med. Assoc.* 1931, xvi, 1286; <sup>4</sup>*Amer. Jour. Med. Sci.* 1930, Dec., 745; <sup>5</sup>*Jour. Pathol. and Bacteriol.* 1931, xxxiv, 213; <sup>6</sup>*Ibid.* 1925, xxviii, 132; <sup>7</sup>*Lancet*, 1931, i, 593.

**THYROID GLAND.** (See ENDOCRINOLOGY; FOOD AND THE PUBLIC HEALTH; GOITRE; HYPERTHYROIDISM.)

### TONSILS, DISEASES OF.

A. J. M. Wright, M.B., F.R.C.S.

**Tonsillectomy for Rheumatic Conditions.**—The question of the association of tonsillar and rheumatic infections is considered by B. Ketz.<sup>1</sup> He points out that the majority of observers who have considered this question statistically have come to the conclusion that there is an etiological relationship between the tonsillar infection and the rheumatism. He has more particularly concerned himself with the reasons for the non-success of the removal of the supposed primary focus in tonsils and adenoids by operation. While in some of these it seems probable that this lack of success is due to the existence of some focus of infection other than in the throat, in many of them the failure is due to the persistence of infection in foci in the throat which have not been removed. These foci are found particularly in the lateral bands of the pharynx consisting of aggregations of lymphoid tissue lying behind the posterior pillars of the fauces, these aggregations extending upwards to the fossæ behind the openings of the Eustachian tubes. In cases in which residual infection is evident in these areas, as shown by hyperæmia and swelling of the parts, he advises their removal by excision either with punch forceps, the diathermy, or the galvanocautery. In his experience excision is preferable to the diathermy or cauterization, which latter should be reserved for those cases which refuse operation.

**Peritonsillar Abscess.**—

*Local Anæsthesia.*—The customary method of producing anæsthesia by painting the mucous membrane previous to the opening of a quinsy, is not very successful. It is stated by M. R. Guttman<sup>2</sup> that by application of cocaine to the mucosa overlying the sphenopalatine ganglion, regional anæsthesia of the peritonsillar area is secured. The method employed is to introduce a cotton applicator, moistened with 20 per cent solution of cocaine, into the nose until it is in contact with the region just behind the posterior end of the middle turbinal. It is stated that in a few minutes the quinsy can be painlessly incised. This method has the advantage that the anæsthetic is not applied to the inflamed surface.

*Spontaneous Hæmorrhage in Quinsy.*—Severe hæmorrhage may occasionally be met with in association with a quinsy, as the result of ulceration into a vessel. This subject was discussed at the Laryngological Section of the Royal Society of Medicine in December, 1929, six cases of severe hæmorrhage being instanced. A discussion ensued as to whether it was advisable to try to control the bleeding at the site or to perform a distant ligation of the external carotid. Opinion was in favour of the former course, the objection to distant ligation being the free anastomosis between the two sides, so that such ligation may not control the bleeding. J. B. Horgan<sup>3</sup> relates a case in which bleeding took place into the lateral wall of the pharynx as a result of a quinsy and was controlled by making a free incision with the evacuation of clot and subsequent plugging of the cavity.

**Tonsil and Adenoids Operations: Complications.**—Owing to the large number of such operations performed, the subject of complications is still receiving attention.

*Hæmorrhage.*—Post-operative hæmorrhage is fully dealt with by J. A. Keene.<sup>4</sup> He is of the opinion that the preliminary administration of 30 gr. of **Calcium Lactate** given in two doses on the day before operation diminishes the amount of blood lost. He considers that a second anæsthetic is extremely dangerous in cases of hæmorrhage, and in his experience dangerous hæmorrhage occurs more frequently from the nasopharynx than from the tonsillar region. He advises a pre-operative test of the bleeding time in cases in which abnormal hæmorrhage is feared, as being of more value than a test of the coagulation time. The bleeding time is estimated as follows: A small cut is made in the lobe of the ear and the blood soaked up at intervals of half a minute with a piece of absorbent paper. Bleeding should normally cease in from one to three minutes, i.e., about six spots of blood are obtained, each successive spot being smaller than the preceding one.

*Septicæmia.*—The occurrence of two rapidly fatal cases of septicæmia following tonsillectomy is recorded by W. R. F. Collis.<sup>5</sup> The evidence seems to prove conclusively that one case was harbouring the infection before operation and infected the other one while they lay next to each other in the recovery room. These cases were operated on under the most favourable conditions as in-patients. The lesson which he propounds is that one should be cautious in recommending operations for the removal of tonsils. [I, personally, should feel inclined to add that the more space that can be allotted to patients during recovery, the less likely is it that they will infect one another.—A. J. M. W.]

*Deep Cervical Infection Following Tonsillectomy.*—This subject is considered by S. L. Shapiro,<sup>6</sup> who reports 30 cases with 3 fatalities. In over 90 per cent of the cases the operation had been performed under local anæsthesia, and he regards injection of infected solution as being the most important factor in etiology. The condition occurs in two forms: (1) A phlegmonous form, in which fever, swelling of the neck, and trismus are present; and (2) A vascular

infection producing septicæmia or pyæmia. An attempt should be made to localize the infection before incising in search of an abscess. Such incision should usually be made from within the pharynx.

**Removal of the Tonsils by Diathermy.**—Destruction of infected tonsils with the diathermy seems to have a useful field in the treatment of cases in which removal by dissection is contra-indicated or refused. D. McKenzie<sup>7</sup> has given a description of the technique which he has found satisfactory (*Plates LXIV, LXV*). To induce anaesthesia, he paints the region with 1-3000 adrenalin solution, followed by 10 per cent stovaine. After from ten to twenty minutes, this is followed by one or two paintings with 10 per cent cocaine with some added adrenalin, and the pillars and peritonsillar regions are then infiltrated with novocain. In nervous people a preliminary hypodermic of morphia and atropine is employed. Various shapes of electrodes are used, the best of all being the simple needle. Electrodes should be short to avoid injury to the tongue, etc., and care should be taken to sterilize them before use, as the diathermy current does not do this. As much or as little as the surgeon thinks fit can be done at each sitting. Caution to restrict coagulation should be particularly observed at the later sittings when the tonsillar capsule is being reached, to obviate the risk of serious secondary hæmorrhage. The needle electrode, owing to its minimum penetration in depth, is particularly suitable for the final stages. The author has not as yet had sufficient experience to decide whether it is necessary to remove the whole of the tonsillar tissue in all cases. As far as possible, the pillars of the fauces should be left intact, to lessen post-operative pain and to diminish scarring. When the removal is nearing its end, intervals of several weeks should be allowed between the sittings, to give time for swelling to subside, otherwise there will always be tissue to diathermize. He notes that in rheumatism from tonsillar infection, improvement is often observed after the first application of the diathermy, probably because the heat sterilizes infected areas. The destruction of the tonsils with the diathermy is a tedious process for both patient and surgeon, the removal taking many weeks if due caution is observed.

REFERENCES.—<sup>1</sup>*Med. Jour. and Record*, 1931, Feb. 18, 185; <sup>2</sup>*Arch. of Oto-laryngology*, 1930, April, No. 4; <sup>3</sup>*Jour. Laryngol. and Otol.* 1931, May, 335; <sup>4</sup>*Ibid.* 297; <sup>5</sup>*Proc. Roy. Soc. Med.* 1931, Jan., 319; <sup>6</sup>*Arch. of Oto-laryngology*, xi, No. 6; <sup>7</sup>*Jour. of Laryngol.* 1930, Oct., 686.

## TOOTHACHE. (See DENTAL PAIN.)

## TORTICOLLIS, CONGENITAL.

John Fraser, Ch.M., F.R.C.S.Ed.

**ETIOLOGY.**—What is the explanation of the condition which in a certain proportion of cases results in the development of a muscle tumour during the weeks which succeed birth, and later is responsible for the fibrosis of a fully-acquired wry-neck?

Stromeyer<sup>1</sup> believed that a rupture of the muscle occurred at birth, the injury being localized to the meeting-point of the sternal and clavicular heads. At this point a hæmatoma developed, the muscle tumour made its appearance following the organization of the hæmatoma, and a fibrosis ensued. There are obvious objections to the 'muscle-rupture' view, but that it has its supporters at the present day is evident from a recent series of letters in the *British Medical Journal* by Roth, Spencer, and others.

The explanation which has come to be known as the 'ischæmic theory' was first suggested by Mikulicz, and elaborated by Nové-Josserand and Viannay.<sup>2</sup> There is agreement that the peculiar disposition of the middle sternomastoid artery and vein may be significant. It may be recalled that these vessels pass beneath the sternal head before distributing their muscular branches, and



## PLATE LXIV

### DIATHERMY DESTRUCTION OF THE FAUCIAL TONSILS

(D. MCKENZIE)

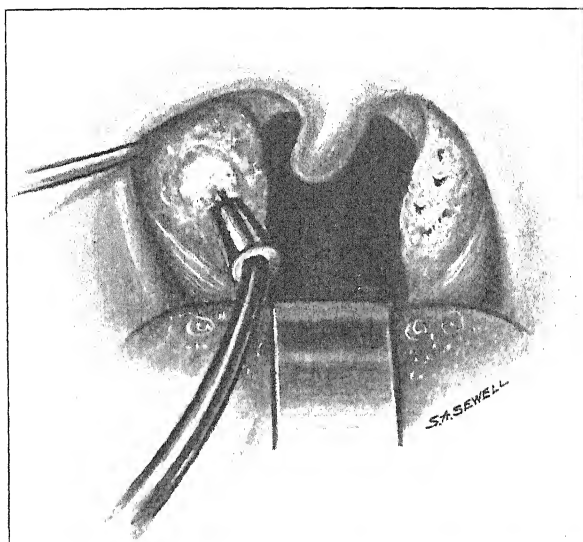


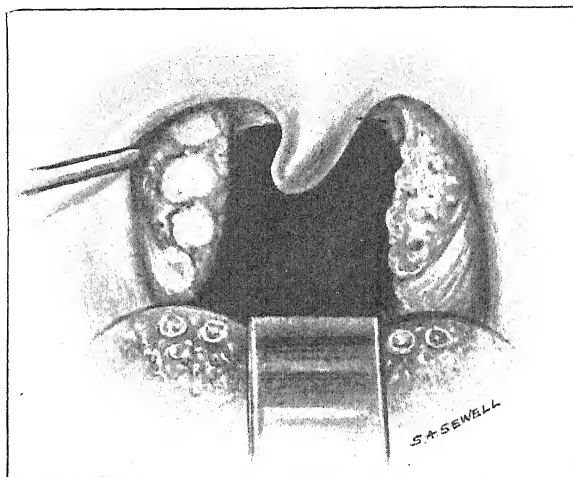
Fig. A.—Application of electrode to tonsil, showing coagulation taking place.

*Plates LXIV and LXV by kind permission of the  
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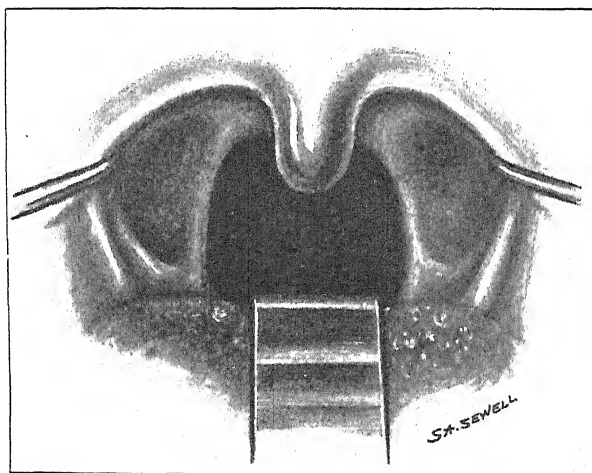
PLATE LXV

DIATHERMY DESTRUCTION OF THE FAUCIAL TONSILS—*continue*

(D. MCKENZIE)



*Fig. B.*—Tonsil at conclusion of séance, showing coagulated areas.



*Fig. C.*—Tonsil bed after complete destruction.

there is reason to believe that while in the submuscular plane they may be submitted to pressure effects which interfere with the circulation. It is upon this peculiarity that the two vascular theories depend. The first is the ischæmic theory of Mikulicz, claiming that during labour there is such disturbance of the sternomastoid muscle that the middle sternomastoid artery is occluded and an ischæmia of the muscle, with subsequent fibrosis, occurs. The second is the venous obstruction explanation suggested by D. S. Middleton<sup>2</sup>, who claims that the sternomastoid tumour, and therefore the wry-neck, results from a temporary acute obstruction occurring during labour, the obstruction being rendered permanent by secondary intravascular clotting in the obstructed venous tree. The weight of experimental evidence is in favour of Middleton's view that an obstruction of the middle sternomastoid veins, with secondary venous clotting, is the factor responsible for the development of congenital torticollis.

**TREATMENT.**—In a fully established torticollis division of the shortened muscle becomes necessary, and there are those who advocate that, in addition to the division, a segment of the muscle should be excised. Division of the shortened muscle by subcutaneous **Tenotomy** is advised and practised by some surgeons, but, while this method may have the advantage of simplicity, it is still open to certain criticisms. While subcutaneous division of the shortened muscle is relatively easy, it is impossible to secure division of the related fascia without risk of injury to vessels. This structure shares in the contraction, and to leave it undivided means not only a persistence of the error but a risk that muscle continuity will be restored, with a recurrence of the original error. **Open Division** of the sternal and clavicular heads is therefore the procedure of choice.

Access to the part is secured by a crescentic incision, and in practice the incision is made over the inner end of the subclavicular area after the skin has been pulled downwards by the fingers. If this procedure is adopted, the irregularity of the shortened heads is avoided, a uniform incision is secured, and injury of the inferior transverse cervical vein is prevented. The muscle heads are thereafter divided; it is probably a wise precaution to excise an inch or so of the affected muscle, and it is important to ensure division of all shortened related fasciæ, particularly those which form the carotid sheath. By manipulation of the head into a corrected attitude the operator assures himself that no shortened bands remain undivided.

**After-treatment.**—This implies maintenance of the head in an attitude of over-correction until healing has occurred (a period of three to four weeks). The position may be secured by bandaging, but to obtain the best results the parts should be secured in a light plaster-of-Paris case. When the period of fixation is past, massage and movements are instituted. Some surgeons also recommend the use of a removable corrective appliance in which an elastic tension maintains the head in an appropriate attitude.

**REFERENCES.**—<sup>1</sup>Quoted by Krogus, *Acta Chir. Scand.* 1923-24, lvi, 497; <sup>2</sup>*Rev. d'Orthop.* 1906, vii, 399; <sup>3</sup>*Brit. Jour. Surg.* 1930, xviii, 188.

## TRACHEA, CARCINOMA OF.

A. J. M. Wright, M.B., F.R.C.S.

Primary carcinoma of the trachea is a rare condition. F. A. Figi<sup>1</sup> states that over a given period, while 470 cases of carcinoma of the larynx were met with, only 5 cases of primary tracheal carcinoma were observed. The condition is more frequently met with in men than in women. The onset of symptoms may be gradual or sudden, the primary symptom being either a tickling sensation in the trachea or dyspnœa. Hoarseness, if it occurs at all, is usually a late symptom. The course of the disease is insidious, without pain but

with increasing dyspnoea, death resulting from suffocation, anaemia, or metastasis. The lesion in the trachea often appears as a fungating mass springing from the lateral or posterior wall. Many cases of malignant disease of the trachea are allowed to progress to an advanced stage under the mistaken diagnosis of asthma, but a careful consideration of the symptoms should prevent this. If any treatment is possible, the most suitable seems to be destruction by the **Diathermy** through a tracheotomy wound, with post-operative **Radiation**.

D. F. A. Neilson<sup>2</sup> has described a fairly typical case, occurring in a man of 54, who gave a history of a troublesome cough for nearly two years, with an absence of any signs in lungs, pharynx, or larynx. Some stridor finally developed, and direct examination showed the growth just above the tracheal bifurcation. Death took place during an acute attack of dyspnoea, to relieve which an attempt was made to dilate the malignant stricture under a general anaesthetic. *Plate LXVII* shows the post-mortem appearance of the neoplasm. This case well illustrates the degree to which the disease can progress without producing symptoms.

REFERENCES.—<sup>1</sup>*Arch. Oto-laryngol.* 1930, xii, 446; <sup>2</sup>*Jour. Laryngol. and Otol.* 1930, Dec., 855.

### TRICHINOSIS.

J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—According to F. C. Aldridge,<sup>1</sup> up to 1914, 1550 cases of trichinosis with 240 deaths—a mortality of 16 per cent—had been recorded in the United States. The disease, however, is probably much more prevalent, as mild cases escape recognition. Blumer estimates that 6 per cent of American hogs have the disease. Aldridge describes an outbreak affecting 29 persons, who were almost all of foreign birth, during a period of twenty-seven days. All but 2 were infected by pork from a single farm. Two died, 4 were acutely ill, 17 had mild attacks, and 5 had practically no symptoms. All but the two fatal cases had the characteristic eosinophilia.

SYMPTOMS AND COMPLICATIONS.—L. F. Carter<sup>2</sup> states that the most characteristic *ocular symptom* of trichinosis is chemosis of the bulbar conjunctiva, which occurs in 50 per cent of the cases. It often lasts only a week and is associated with œdema of the lids which later extends to the temporal and frontal regions, and finally may involve the entire face. Painful movement of the eyes is frequent. Exophthalmos, conjunctival ecchymoses, mydriasis, and retinal hemorrhages occur with varying degrees of frequency.

H. Bosch<sup>3</sup> reports a case of trichinosis in a woman, age 51, complicated by *bilateral deafness*, which he attributes to toxic neuritis similar to that encountered in other infectious diseases, such as influenza, scarlet fever, and diphtheria. Otitis media could be excluded.

REFERENCES.—<sup>1</sup>*Amer. Jour. Med. Sci.* 1931, clxxxii, 312; <sup>2</sup>*Jour. Amer. Med. Assoc.* 1930, xcv, 1420; <sup>3</sup>*Munch. med. Woch.* 1931, 431.

### TRICHOMONAS VAGINALIS VAGINITIS. (See VAGINITIS.)

### TRICHOPHYTIDES. (See SKIN, FUNGUS AFFECTIONS OF.)

### TRYPANOSOMIASIS.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

ETIOLOGY AND PROPHYLAXIS.—The metabolism of trypanosomes has been further investigated by A. Geiger, I. J. Kligler and R. Comaroff,<sup>1</sup> who found that *T. evansi* consumes glucose *in vitro* with the production of lactic acid, the accumulation of which inhibits the development and destroys the trypanosome; but that *in vivo* the lactic acid is partly eliminated and partly oxidized, with consequent isolation of the alkali reserve and the production of an acidosis.

PLATE LXVI

PRIMARY CARCINOMA OF THE TRACHEA

(D. F. A. NELSON)



Trachea and bronchi divided in the mid-line posteriorly.

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This is suggestive in view of the favourable effects of bicarbonates in malaria, as shown by A. J. Sinton. The same workers in a further paper<sup>2</sup> show that *T. evansi* is sensitive to hydrogen-ion concentration, a pH of 6·8 inhibiting their growth, and this is brought about by the fermentation of glucose in the presence of oxygen to form lactic acid. Experiments on the mechanical transmission of trypanosome infections by biting flies has been investigated by A. W. Taylor,<sup>3</sup> who found that *T. brucei* was only carried by *G. tachnoides* if re-fed on the healthy animal within ten minutes of biting the infected one, although motile trypanosomes may be found up to three hours in the proboscis, and that the same tsetse fly failed to transmit *T. gambiense* under similar conditions. A. W. Taylor and H. M. O. Lester<sup>4</sup> found that mixing two strains of trypanosomes does not increase the infection-rate through flies. G. K. Maurice<sup>5</sup> has recorded an interesting account of the campaign against sleeping sickness in the southern Sudan, which was invaded by the disease in 1905, and later in the Belgian Congo. By means of frontier examinations to limit the entry of the disease, and segregation camps for the infected people, during the last twenty years the disease has been almost stamped out.

D. E. Wilson<sup>6</sup> reports on the diagnostic value of a non-specific precipitin test in sleeping sickness carried out by adding one drop of the patient's serum to 1 c.c. of various dilutions of HgCl<sub>2</sub>, from 1-15,000 to 1-35,000, and noting the precipitation produced. Positive reactions were always obtained before treatment, but become negative after efficient treatment. The results resembled those produced by the serum formalin reaction. Organic arsenical compounds orally in the prophylaxis of experimental trypanosomiasis in rats is dealt with by J. A. Kolmer,<sup>7</sup> who concludes that **Stovarsol** and **Treparsol**, 0·03 to 0·04 grm. per kilo., and **Atoxyl**, 0·02 to 0·03 grm. per kilo., for three to ten days prevented infection with *Tr. equiperdum*, but tryparsamide and Bayer 205 were ineffective.

**TREATMENT.**—W. Yorke and F. Murgatroyd<sup>8</sup> have carried out experiments to test the action *in vitro* of certain **Arsenical** and **Antimony Preparations** on *T. rhodesiense*, on both normal and atoxyl- and acriflavine-resistant strains. They found that pentavalent compounds were but slightly trypanosomicidal, but the organic trivalent arsenical compounds (including novarsenobillon and arsenophenylglycinamide) are extraordinarily active, as when diluted several million times they killed trypanosomes within twenty-four hours. The two resistant strains both showed very different degrees of resistance to the various organic compounds of arsenic. The authors conclude that the trivalent preparations have a direct lethal action on the trypanosomes, but the pentavalent ones are probably converted into the much more active trivalent ones in the body. J. F. Corison<sup>9</sup> reports further on cases of trypanosomiasis rhodesiense treated in Tanganyika in 1926-7, and states that, of 64 cases, 27 (42 per cent) may be regarded as recovered, mostly early cases treated with **Bayer 205**. Parasitic blood-relapse is a very bad sign.

**REFERENCES.**—<sup>1</sup>*Ann. Trop. Med. and Parasitol.* 1930, Oct. 22, 319; <sup>2</sup>*Ibid.* 329; <sup>3</sup>*Trans. Roy. Soc. Trop. Med. and Hyg.* 1930, Nov. 25, 289; <sup>4</sup>*Ibid.* 305; <sup>5</sup>*Jour. R.A.M.C.* 1930, Sept., 161; <sup>6</sup>*Jour. Trop. Med. and Hyg.* 1930, Aug. 1, 217; <sup>7</sup>*Amer. Jour. Trop. Med.* 1931, July, 261; <sup>8</sup>*Ann. Trop. Med. and Parasitol.* 1930, Oct. 22, 449; <sup>9</sup>*Ibid.* 1931, March 31, 63.

#### **TUBERCULOSIS, BOVINE, IN MAN.** (See also VETERINARY SURGERY IN RELATION TO PUBLIC HEALTH.) G. E. Oates, M.D., M.R.C.P., D.P.H.

A Memorandum of the Ministry of Health<sup>1</sup> outlines the position in this country regarding the incidence of tuberculosis and the proportion due to bovine infection, the incidence of tuberculosis in cattle, and the estimated percentage of milk from those animals proving tuberculous, and summarizes

the available known measures which can successfully be adopted for mitigating or preventing the infection of consumers of such milk with the bovine bacillus.

The Royal Commission on Tuberculosis (1904-11) and later investigators have established the fact that tuberculosis in animals and in man is the same disease, and the causative organisms are varieties of the same species. It is, however, possible by observing the cultural peculiarities and pathogenic properties of the organisms concerned to distinguish three definite types, the human, the bovine, and the avian. In spite of the differences shown to exist between the human and bovine varieties of the tubercle bacillus, it has been amply demonstrated that man can be infected with the bovine, as well as with the human, type of the tubercle bacillus, and, in fact, many fatal cases of tuberculosis in man are due to infection with the bovine variety of the organism. It is in children especially that the bovine bacillus is found, and there is no doubt that a considerable amount of the tuberculosis of childhood is due to infection with bacilli of this type conveyed in milk from tuberculous cows. The main facts set forth in the Memorandum may be summarized as follows:—

1. The death-rates for non-pulmonary forms of tuberculosis in England and Wales, while still high, are decreasing, the rate for 1929 being less than half that for 1911. Loss of life and invalidity from this disease are, however, still matters of grave concern.

2. It is not possible at present to say what proportion of the cases of tuberculosis in human subjects are of bovine origin, but it seems probable that more than 1000 children under 15 years die annually in England and Wales from infection of this origin.

3. It is practically certain that the great majority of human infections with the bovine tubercle bacillus are conveyed by means of cow's milk, and that infection usually occurs during the early years of life, when milk forms a large part of the diet and when susceptibility to infection is greatest.

4. The proportion of milch cows in this country infected with tuberculosis is probably not less than 40 per cent. The proportion of cows actually yielding tuberculous milk is probably between 1 and 2 per cent.

5. Complete eradication by means of universal tuberculin testing and the slaughter of all reacting animals is not practicable in this country, not only on account of the expense and the dislocation of the milk-supply which would be involved in any attempt at such a measure, but also because it is doubtful whether complete and permanent eradication could be effected by this means. A less drastic procedure, but one also involving the slaughter of infected animals, is represented by the Ministry of Agriculture's Tuberculosis Order of 1925. This Order aims at the destruction of cattle in an advanced and more infectious stage of the disease, and cannot be expected, without the introduction of adjuvant measures, seriously to affect the incidence of the disease in cattle or man.

6. The routine clinical examination of cattle has only been tried to a small extent in England. To be fully effective, it would involve the thorough and systematic examination by competent veterinary surgeons of all milk herds at stated intervals, such as half-yearly, and the exclusion of those found diseased. There is reason to believe that such a procedure, when employed in combination with other methods of prevention, is productive of good results.

7. The testing of milk for tubercle bacilli by the microscope and by the inoculation of susceptible animals can be of great value, especially when applied to samples from herds of moderate size and combined with competent clinical examination of the cattle.

8. The official grading of milk should constitute an important element in any comprehensive scheme for the improvement of the milk-supply. Certified



milk and Grade A (Tuberculin Tested) milk are produced by herds which are clinically examined and tuberculin-tested every six months. These milks must not be treated by heat and may be regarded as safe as regards tubercle infection. There are only some 400 herds in England and Wales producing Certified or Grade A (T.T.) milks, and the quantity of milk produced is only a small fraction of the national supply.

9. All measures aimed at the reduction of bovine tuberculosis must lose a great part of their effect so long as milch cows are kept under conditions which favour the spread of bovine infection. The disease in cattle is spread by means of the secretions of infected animals, adult animals being usually infected by others with lung tuberculosis, and calves by the consumption of milk from tuberculous mothers. Cows with pulmonary tuberculosis swallow a large proportion of the infectious secretions coughed up from their lungs, so that their faeces may become heavily infected and contaminate pasture, litter, and stalls, providing additional channels of infection. Old and grossly insanitary cowsheds are still common, and new sheds are often constructed (or old ones adapted) in a manner displaying ignorance of the principles governing the spread of infection.

10. Pasteurization is the method of treating milk by heat in such a way as to destroy the pathogenic organisms present without causing those chemical and physical changes in the milk which result from boiling. 'Milk sold as 'pasteurized' must have been kept at a temperature of not less than 145° F. and not more than 150° F. for at least half an hour, and then immediately cooled to a temperature of not more than 55° F., the milk being heated once only and not otherwise treated by heat. Milk treated by such a process closely resembles raw milk in taste and appearance and a good quantity of visible cream rises to the surface on standing. Whilst pasteurization does not afford an absolute guarantee that the milk so treated will contain no living tubercle bacilli, it may be accepted that any such bacilli will be present in such small numbers as to constitute a very slight risk of infection for the consumer. The effect of pasteurization upon the vitamins of milk is of great practical importance in the dietetics of children. Present knowledge indicates that of these only vitamin C is injuriously affected by pasteurization. It appears, therefore, that pasteurization carried out in a suitable apparatus and under strict scientific control is capable of protecting the consumer from the danger of infection with the tubercle bacillus, and that milk so treated retains its valuable food properties practically unimpaired.

REFERENCE.—*Report No. 63 on Pub. Health and Med. Subjects, Min. of Health, H.M. Stationery Office.*

### **TUBERCULOSIS IN CHILDREN.** *Reginald Miller, M.D., F.R.C.P.*

**Mantoux Test.**—A. Moncrieff<sup>1</sup> legitimately criticizes the value of many of the investigations published on the Mantoux intradermal tuberculin test on the ground that they afford no proper indication of the value of the test in individual cases of diagnostic difficulty where the possibility of clinical tuberculosis has to be seriously considered. As he points out, to take a large series of children, submit them to the test, find the proportions positive and negative at different ages, and serve up some statistical result—all this is of very little assistance when we are faced with the task of diagnosing or excluding tuberculosis as the cause of illness in some particular child. In Moncrieff's view there is a tendency to give the test a diagnostic importance which is not really warranted on the evidence. He has, therefore, attempted to make a more clinical study of the test in order to assess its value to the physician faced with some problem of diagnosis in a sick child. He reaches the following

conclusions as to the value of negative and positive reactions in individual sick children :—

1. The value of a negative reaction is reduced by the possibilities of several fallacies. The tuberculin used may not be potent, the injection may be made subcutaneously instead of intradermally, the patient may fall into the small group where bovine tuberculin is necessary to obtain a positive result and which is negative with human tuberculin, or finally, the patient may be in such a state of acute tuberculosis or of some acute illness not due to tuberculosis (such as measles) that a negative result is obtained with ordinary doses of tuberculin. All these positive dangers connected with negative results with tuberculin are comparatively easy to combat by careful work, but they must always be borne in mind when interpreting results. With these reservations a negative reaction with intradermal tuberculin is usually of valuable help in excluding tuberculosis.

2. A positive intradermal tuberculin reaction at the most means that the patient has at some time or other been infected with tuberculosis: one of the present cases throws some doubt even on this conclusion. If the test is not carefully controlled it may not even mean this, and the older the child the more likely is the tuberculin test to be useless in the diagnosis of the nature of the illness affecting individual patients. But where this age limit is to be fixed, below which a positive test is to be accepted as of value, is most difficult, and in the present series even at fifteen months of age one child gave a positive tuberculin reaction while recovering completely from a streptococcal empyema. Modern figures for London children (B. Schlesinger and P. D'A. Hart<sup>2</sup>) in 1930, indicate that among hospital out-patients, not in contact with tuberculosis in the home, one-fifth are positive to tuberculin intradermally by six years of age. Even in the early years of life, therefore, there is a very wide margin of error if a positive tuberculin test is to be regarded as indicating the nature of a particular patient's illness.

The positive Mantoux reaction must, therefore, be utilized for diagnostic purposes with considerable restraint. A positive result at even an early age should never be allowed to establish a diagnosis, but should merely take its place as a piece of evidence to be taken into consideration in the process of making a diagnosis, to be disregarded if necessary. After the first few years of life it becomes even more important to avoid establishing for any pathological condition in a child a diagnosis based mainly or entirely upon a tuberculin reaction. For surveys of large groups of children this test has proved its value, but for the individual patient with vague symptoms the Mantoux reaction, in common with all tuberculin tests, may be a good servant but is a dangerous master.

W. F. Gaisford,<sup>3</sup> from an analysis of 500 cases tested by the Mantoux test, is inclined to put a higher value on a positive result than Monierieff concedes. A. G. Ogilvie<sup>4</sup> regards the intradermal Mantoux test as the best of the tuberculin tests in use at the present time. He regards it as being most reliable in children under three years of age, and agrees that its value declines with increasing years. He mentions diseases of bones and joints as conditions in which the Mantoux test is of most assistance in diagnosis. Negative results are, he states, reliable throughout childhood apart from acute illness, fulminating tuberculosis, or periods of lowered resistance due to any cause. In the latter, 20 per cent may give reactions. Contra-indications to the use of the test are few: conjunctival inflammation, and tuberculosis or sepsis of the skin are the chief.

**Epituberculosis.**—B. Goldberg and B. M. Gasul<sup>5</sup> present a study of ten examples of this condition, in each of which recovery had occurred within two years or was well on the way. Their case records are well equipped with

skiagrams showing the changes present in the chest during the two years over which their observations extended in each case.

'Epituberculosis' is the name none too happily applied to a condition in children which gives the physical and radiographic evidence of massive involvement of the lung affecting the whole or part of a lobe, usually apical. The importance of it lies in the fact that the condition is not of the serious nature that such signs would legitimately suggest. The symptoms are not those of extensive pulmonary tuberculosis in a child: there is little or no fever, cough is not persistent, sputum is scanty and shows no tubercle bacilli, and altogether the child does not appear seriously ill. The benign nature of the condition is confirmed by its course, which is towards complete recovery, though the resolution of the lung may take many months, perhaps two years.

Epituberculosis is probably the same condition as was in 1883 called 'splenopneumonia' by Grancher,<sup>6</sup> who regarded it as a subacute bronchopneumonia; and Hutinel<sup>7</sup> in 1911 was the first to note the association between 'splenopneumonia' and hilus tuberculosis. After that date a good deal of attention was paid to the condition by Continental authors, and various alternatives, mostly unsupported by pathological evidence, were advanced to explain the type of lesion in the lung. Thus Ranke<sup>8</sup> called it 'perifocal inflammation'; Tendeloo,<sup>9</sup> 'collateral inflammation'; Fraenkel,<sup>10</sup> 'gelatinous inflammation'; Ribadeau-Dumas,<sup>11</sup> 'perituberculous infiltration'; and Engel,<sup>12</sup> 'paratuberculous lung affection'. In 1920 Eliasberg and Neuland<sup>13</sup> separated this benign condition from the usual severe types of massive pulmonary tuberculosis in children, and called it 'epituberculosis'; and in the following year<sup>14</sup> were able to confirm their opinion by the study of an autopsy on one of their cases which had died of intercurrent bronchopneumonia and empyema. In 1922 Epstein<sup>15</sup> published a more satisfactory post-mortem examination, and was able to demonstrate an area of pulmonary atelectasis (in which no tubercle bacilli could be found) beyond the site of a large caseous tuberculous focus.

The importance of epituberculosis lies in its separation from cases of extensive pulmonary tuberculosis in which the physical signs may be very similar. The symptoms are, however, very different in the two conditions: in the one, a benign course without serious illness, and a tendency to complete recovery; and in the other, severe illness, grave symptoms, and a fatal prognosis. The actual lesion in the lung corresponds best with an extensive collapse secondary to bronchial obstruction by pressure of a tuberculous gland or area of infiltration; but Goldberg and Gasel conclude that in any given case it is not likely to be clear whether the epituberculous area is a collateral inflammation, an atelectasis, or a truly tuberculous parenchymal involvement.

[In connection with this subject it may be of interest to mention that the reviewer was taught by W. B. Cheadle that in a child pneumonic consolidation might remain unresolved for as long as two years and yet recover completely. This great pediatrician may have been referring to the same type of case now called 'epituberculosis', and if so, it is of interest to see how he had classified it in his mind.—R. M.]

**Fatal Tuberculosis in Children.**—Agnes R. Macgregor<sup>16</sup> publishes an analysis of 250 autopsies on cases of tuberculosis in children under 12 years of age, in which tuberculosis was the cause of death in 204 cases. Her results, very admirably worked out, confirm ordinary clinical teaching in almost every particular. She found that latent or quiescent lesions are relatively rare in childhood, very rare under 2 years of age, and almost non-existent under 1 year; also that calcified foci were exceedingly rare in children under 3 years of age. Deaths from tuberculosis in infants up to 12 months were usually due to primary thoracic (human) tuberculosis; primary abdominal cases were

as numerous as thoracic in the second year of life, and exceeded them in the third and fourth years. Deaths from primary thoracic tuberculosis showed an increase in the spring months and early summer; abdominal cases did not show this seasonal variation. Primary thoracic tuberculosis she found to become generalized and end with meningitis in a larger proportion of cases than happens in abdominal or cervical tuberculosis: meningitis was comparatively rare in generalized tuberculous peritonitis. In considering these results it must be borne in mind that all the author's material was derived from fatal cases, 66 per cent of which ended with tuberculous meningitis.

**Preventive Vaccination with B.C.G.**—An invitation extended to Professor A. Calmette by the Children's Section of the Royal Society of Medicine resulted in a lecture<sup>17</sup> of the greatest interest which can be dealt with here only very briefly. He told of the many years he had given to the problem of the production of a strain of tubercle bacilli which should prove absolutely innocuous but retain their power of immunization in the patient vaccinated; and how on repeated growth on bile potato medium, loss of virulence with retention of immunization power was noted, until after 230 passages on bile potato no more modification ensued. This is the preparation now known as 'B.C.G.' (bacillus Calmette-Guérin) which has been so extensively used. The first human experiment was made by Calmette in July, 1921, after innumerable tests in animals had proved the B.C.G. to be entirely innocuous. The child was born of an actively tuberculous mother who had died, and was to be brought up by a tuberculous grandmother. The child was given 6 mgrm. B.C.G. in three doses per os with a brilliantly successful result. After this Calmette felt able to proceed with the treatment of many babies born of tuberculous parents, altering the dose of B.C.G. to 30 mgrm. divided into three doses of 10 mgrm. each, absorbed at forty-eight-hour intervals, the vaccination taking place immediately after birth. Starting with cases born of tuberculous mothers, Calmette found the results so satisfactory that he quite logically extended the practice to those born in healthy surroundings. The lecture includes the results obtained by various investigators in different parts of the world, and answers the criticisms which have been made of Calmette's system of preventive vaccination.

REFERENCES.—<sup>1</sup>*Quart. Jour. Med.* 1931, Jan., 153; <sup>2</sup>*Arch. of Dis. Childh.* 1930, v, 191; <sup>3</sup>*Lancet*, 1931, i, 521; <sup>4</sup>*Newcastle Med. Jour.* 1931, April, 122; <sup>5</sup>*Amer. Jour. Med. Sci.* 1930, Dec., 824; <sup>6</sup>*Proc. Soc. méd. d. Hôp.* 1883, viii, 13; <sup>7</sup>*Gaz. des Hôp.* 1911, lxxxiv, 76; <sup>8</sup>*Münch. med. Woch.* 1912, vii, 2099; <sup>9</sup>*Allg. Pathol.* 1919, 409, 416; <sup>10</sup>*Path. Anal.*, Kaufman, 1922, i, 341; <sup>11</sup>*Jour. Méd. et Chir. prat.* 1919, xc, 933; <sup>12</sup>*Berl. klin. Woch.* 1921, xxxi, 877; <sup>13</sup>*Jahrb. f. Kinderheilk.* 1920, xciii, 88; <sup>14</sup>*Ibid.* 1921, xciv, 102; <sup>15</sup>*Ibid.* 1922, xcvii, 99; <sup>16</sup>*Edin. Med. Jour.* 1930, xxxvii, 665; <sup>17</sup>*Proc. Roy. Soc. Med. (Sect. Dis. Childh.)*, 1931, xxiv, 85.

## TUBERCULOSIS OF JOINTS. (See also TUBERCULOSIS, SURGICAL.)

E. W. Hey Groves, M.S., F.R.C.S.

S. J. H. Griffiths, F.R.C.S.

The need for surgical intervention in the treatment of tuberculous joints with a definite bony focus is becoming more recognized. The 'noli-me-tangere' attitude has been completely changed. Once there is a definite focus in a tuberculous joint, then the only criterion of cure is bony ankylosis. Without secondary infection the only way this can be obtained with any degree of certainty is by operative interference. Prolonged immobilization in tuberculous disease of the knee or shoulder will produce a fibrous ankylosis and a false sense of security, and any sudden strain to this fibrous union may suffice to set the whole tuberculous process ablaze once again. It is hard to cast from the mind the dictum of our masters—"Do not open a closed tuberculous lesion", and to suggest carrying the knife into such a forbidden field seems

almost sacrilege. However, such is the modern trend, and it is gaining ground at home and abroad in spite of much opposition.

R. A. Hibbs,<sup>1</sup> of New York, urges the radical treatment of tuberculous joints. He analyses 172 cases in which a fusion operation has been performed, and in no instance has there been a recurrence of the disease in the fused joints. The patients have been freed from the constant danger to life by extirpation of the disease from the active focus in the joint, as well as from the necessity of years of treatment in hospital or clinic.

**Tuberculous Disease of the Shoulder.**—This condition presents many difficulties in treatment and it is most difficult to provide adequate prolonged immobilization in the best possible position for ankylosis. A more radical method has been excision, which aims at removal of the head and the diseased portions with a hope that a mobile joint will result. Failure to remove all the diseased bones results in a failure to eradicate the disease; on the other hand, removal of too much will produce a flail and almost useless shoulder-joint. Ollier, who was an advocate of this method of treatment, is of the opinion that it may fail even with the best of operative technique, especially when the patient has not had regular post-operative treatment or if ossification comes to threaten the mobility of the joint. But it is hard to believe that excision, however well done, will result in a mobile joint and at the same time arrest the tuberculous process. Many of the advocates for excision of the head of the humerus in tuberculous disease of the shoulder are satisfied if an ankylosis in good position results, and as bony ankylosis is the criterion of cure, all surgical procedures aimed at treating this condition should be of the nature of an arthrodesis.

Satisfactory arthrodesis of the shoulder is a procedure of no mean difficulty, and R. Massart,<sup>2</sup> in discussing tuberculous disease of the shoulder at some length, describes a method of arthrodesis which commends itself. He stresses the necessity and importance of obtaining adequate exposure, and with good arguments condemns most of the usual methods of approach. He advises the Neudorfer epaulette incision above the joint. This is a trans-acromio-clavicular incision which is begun at the posterior border of the scapula where the plane of the glenoid cavity, if prolonged, would meet the acromion, and it is continued forward to the coracoid process. It involves division of the acromion process and the external end of the clavicle. This bony fragment is retracted outwards and the joint capsule exposed. This is opened and the tendon of the biceps lifted out of the bicipital groove. The muscles attached to the great tuberosity are ruined off; the head of the bone is dislocated, and, after the infraspinatus has been detached, is sawn off. Massart says that this exposure is beautiful and that objections to sections of the clavicle and acromion are purely theoretical. Automatic retractors can be put on the edges of the incision and one can operate upon the shoulder with the same exposure as if it were a little bowl whose lid had been taken off. The affected parts are entirely dissected away and a complete and satisfactory operation is performed. No vessels require tying and there is no hemorrhage except from the cut bone surface. After the articular toilet has been performed, the empty space is made up by osteo-periosteal grafts taken from the tibia, going from one bone to the other. The capsule is closed, the muscle layers are reconstituted, and the clavicle and acromion sutured in their respective places. There is no need to use any metal sutures—indeed, the author is of the opinion that it is unwise to leave metal in contact with an area of bone repair. The wound is closed without drainage. This is an essential point in operating for tuberculosis, and any drain is useless since this operation is almost bloodless. The immobilization of the shoulder must be done immediately whilst the

patient is anesthetized, and the arm fixed so as to maintain 30° of abduction and 60° of internal rotation. The rotation is maintained by pressing the flexed forearm against the lower part of the chest. The whole is maintained by light plaster bandages. At the end of two months the shoulder is firm, the severed extremities are reunited to the acromion and clavicle, and a nucleus of bone runs between the humerus and scapula. Massart continues the immobilization for another two to three months. He quotes a number of cases with the end-results; they are encouraging and fully justify a trial of this method of arthrodesis.

**Arthrodesis of the Hip.**—L. C. Abbott and F. J. Fischer<sup>3</sup> write from the Shriner's Hospital, Washington, on arthrodesis of the hip. They express the opinion that failure is most often due to neglect of fundamental principles of treatment—namely, the apposition of wide areas of cancellous bone under complete immobilization and firm pressure. They advise adequate exposure through a Smith-Peterson incision. After thorough removal of the diseased portions the limb is placed in wide abduction with the head of the bone forced into the acetabulum right up to the great trochanter. At this stage the sole aim is to secure bony ankylosis and no attempt is made to obtain the best position. In some cases as much as 90° of abduction is required and the limb is fixed in plaster. This position of wide abduction is subsequently corrected by a subtrochanteric osteotomy followed by a gradual bending of the callus. (*Plate LXVII.*)

**The Peg Leg Plaster Cast.**—In many conditions of hip disease and deformity it is necessary to put the limb up in abduction, using a plaster-of-Paris cast. In all these the difficulty arises of having to keep the patient recumbent so long as to ensure maintenance of the abducted position—that is to say for three to six months. But this period of recumbency can be greatly shortened by the use of a device known as the peg leg cast, described by W. P. Blount,<sup>4</sup> and attributed by him to Roeren of Suchteln, Germany. *Plate LXVIII* gives an excellent idea of this device applied in a case of congenital dislocation of the hip.

After the original deformity of the hip has been corrected and the limb fixed in abduction by the usual plaster cast, a certain interval of a few weeks is given during which the patient lies in bed with the leg fully abducted. Then a light peg leg or pylon is incorporated in the cast in such a way as to lie parallel to the sound leg when the latter is in a neutral position, and of such length as to make its end take bearing on the ground when the patient is wearing a shoe on the good leg.

When this has set, the patient can walk with the aid of crutches, and in doing so he uses the good leg and the peg leg, whilst the abnormal leg is held well off the ground in a position of abduction.

REFERENCES.—<sup>1</sup>*Jour. Bone and Joint Surg.* 1930, Oct., 749; <sup>2</sup>*Rev. de Chir.* 1930, April, 112; <sup>3</sup>*Surg. Gynecol. and Obst.* 1931, April, 863; <sup>4</sup>*Jour. Bone and Joint Surg.* 1931, Jan., 107.

**TUBERCULOSIS IN PREGNANCY.** (*See PREGNANCY AND ITS COMPLICATIONS; TUBERCULOSIS, PULMONARY.*)

**TUBERCULOSIS, PULMONARY.** (*See also DIABETES; PNEUMONOCOSES; PYREXIA, CONTINUED; TUBERCULOSIS IN CHILDREN.*)

W. H. Wynn, M.D., F.R.C.P.

**INFECTION.**—The common conception of tuberculous infection is that it generally occurs during the early years of childhood and that pulmonary tuberculosis in the adult shows the characteristics of localization and chronicity because it occurs in a person previously immunized by a mild infection in his

## PLATE LXVII

### ARTHRODESIS OF THE HIP

(L. C. ABBOTT AND F. J. FISCHER)



*Fig. A.*—Bony ankylosis after arthrodesis in wide abduction.



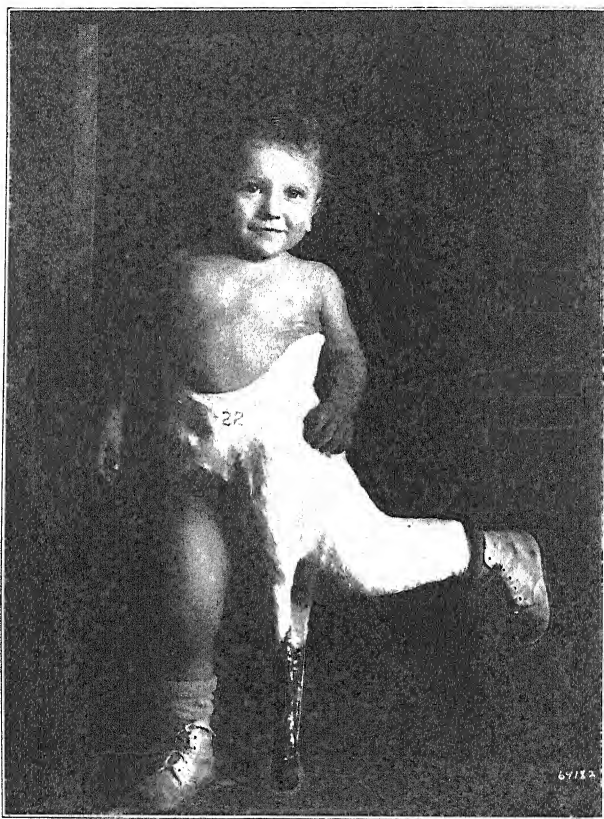
*Fig. B.*—Correction of widely abducted position by subtrochanteric osteotomy and bending of the callus.

*By kind permission of  
'Surgery, Gynecology and Obstetrics'*

*PLATE LXVIII*

THE PEG LEG PLASTER CAST

(W. P. BLOUNT)



*By kind permission of the  
'Journal of Bone and Joint Surgery'*



early years. It is difficult to bring certain facts—for instance, the morbidity at the ages between 20 and 30—into line with this theory. Since 1926 J. Heimbeck<sup>1</sup> has been studying the incidence of tuberculous infection and its relation to morbidity at various ages and in various classes in Oslo. He uses the Pirquet cutaneous tuberculin test. His method was to make two transverse stripes of concentrated old tuberculin (equal parts of human and bovine) 2 cm. long and 5 cm. apart on the upper part of the left arm. The epidermis is cut with a lancet through the stripes and left uncovered for ten minutes. The reaction is judged after forty-eight hours. If there is an area of 5 mm. or more of redness and infiltration along the incisions, the reaction is taken as positive. If the area is less or absent, the test is repeated and again judged in forty-eight hours. If then positive, the reactions from the first test will be strengthened and the second test more vigorous. In children under 15 the reaction at the first test was so reliable that in mass investigations a second one was unnecessary as only 0.8 per cent of the children giving a negative reaction at the first test gave a positive one at the second. Heimbeck's investigations concerned two classes of town-dwellers, the middle class and the working class, and the country-dwellers. Of town-dwellers 3743 were examined—2188 of the working class and 1555 of the middle class. They were arranged in three-year groups—from birth to 3 years, from 4 to 6 years, and so on until the age of 30, and then in ten-year groups up to 50, and all above 50 in one group. In the working class the following results were obtained: 10 per cent of the first group gave a positive reaction, i.e., were infected with tuberculosis; 22 per cent of the second group; and 23 per cent of the third group up to 9 years of age. Then began a more rapid increase to 38 per cent in the next three-year period to 12 years of age, reaching 50 per cent in the next group; from 22 to 24 years of age there was a steady rise to 85 per cent, and from 28 to 30 years to 98 per cent, while from 40 to 50 years of age all subjects, or 100 per cent, were infected. Thus even among the working class, most of whom lived crowded together in tenement houses, only the minority were infected in childhood. In the middle class infection occurred later. Only 7 per cent up to 3 years of age were infected, and the percentage rose slowly until the age of 18, when 26 per cent were positive. After this age there was a sharp rise reaching 84 per cent in the following twelve years, and 100 per cent in the ages 40 to 50. Similar results were found in the country-dwellers, but the curve ran more smoothly, and by no means all became infected. The conclusions drawn were that in childhood only a small number are infected with tuberculosis, and the percentage increases slowly during this period of life, as the children are kept at home. When they are infected at this age it is usually because there are cases of tuberculosis at home. Then with the transition to a working life the second and great period of infection begins. It is in this period of youth that the majority of people, and all who have escaped infection during childhood, become infected. Morbidity curves showed a slight morbidity during childhood and a widespread morbidity during the young adult period, corresponding to the time when the second period of infection occurred. Then the number of new cases gradually fell to zero. The morbidity curve confirmed the suggested theory of infection and supported the view that tuberculous disease is a direct result of the primary tuberculous infection.

A second part of the author's investigations concerned tuberculous infection in nurses in a municipal hospital containing about 1500 beds of which 300 were for tuberculous cases. There is ample opportunity for the nurses to become infected. About 110 new probationers are admitted each year and live in hospital under the same conditions. A von Pirquet test has been done on each nurse since 1924. It was found that only one-half of these women, 21 years

of age, two-thirds of whom came from towns and one-third from the country, gave a positive Pirquet reaction. Further observation showed a great morbidity from tuberculosis among those who first gave a negative Pirquet reaction, and a slight morbidity among those who had a positive Pirquet reaction to start with. Among the probationers of 1924, 17 of the 51 who started with a negative reaction eventually contracted the disease, while there was only 1 case among the 58 with a positive reaction. In the 1925 class there were 21 cases among the 72 with a negative reaction, and 1 case among the 42 with a positive reaction. In the 1926 class 15 cases occurred among the 62 with an initial negative reaction, and 1 case among the 52 with a positive reaction. All the nurses were, of course, carefully examined and found to be healthy on admission. In this respect all were alike. They differed only as regards their Pirquet reaction. How great was the chance of infection in hospital was shown by the fact that in the course of three years' training all, or 100 per cent, became infected. The extension from 50 to 100 per cent of infected cases, which takes about twenty years in the middle class under ordinary conditions, occurs among nurses in only three years. The examination of medical students showed similar results: 56 per cent gave a positive reaction before they began clinical work, but after two years of hospital work 98 per cent were positive. The morbidity was also high, for 19 of the 339 students were found to have tuberculous disease.

The time when symptoms of tuberculosis were noted in nurses originally giving a negative reaction gives definite information as to the interval between infection and the appearance of disease. During the first six months of training there were 31 cases, during the second six months 16, during the whole of the second year 18, and after the second year 6 cases. There were 81 cases in all during the years examined, 10 being among the 372 nurses originally giving a positive reaction and 71 among those giving a negative reaction. It is concluded that there is not a long latent period between the infection and the outbreak of the disease. The case of one nurse is given in detail with X-ray pictures. In this case symptoms were first noted after working with tuberculous cases for one month, and the Pirquet reaction, previously negative, was found to be positive. X rays showed an infiltrated area external to the hilus of the right lung the size of a hen's egg. An eruption of erythema nodosum followed with fever, the infiltrated area in the lung extended, and another outbreak of erythema nodosum occurred. Less than two months could have elapsed since the date of the probable infection.

Heimbeck decided to use **B.C.G. Vaccine** in the attempt to immunize the nurses with the negative Pirquet reaction. The vaccine was injected subcutaneously. The first experiment with a dose of 0.2 mgrm. of B.C.G. suspended in normal saline resulted in a cold abscess. The dose has since been reduced to 0.03 and 0.02 mgrm. The production of cold abscesses has not entirely ceased, but occurs in 2 to 3 per cent. The abscess may persist up to four months, but does not interfere with work or cause any symptoms. Immediately after training is started and the Pirquet reaction obtained, those nurses who wished were vaccinated. They were kept away from tuberculous patients for six weeks. The unvaccinated nurses with a negative Pirquet were also kept away for six weeks. The results show that since 1927 there have been 3 cases of tuberculous disease among the 160 vaccinated nurses against 15 among the 35 unvaccinated nurses. The results were submitted to Professor H. Westergaard, the well-known Danish statistician. In calculating the morbidity of tuberculosis among the nurses on the basis of the actual constant number of those in training, he found a morbidity of 4.08 per cent among those with a positive Pirquet reaction, of 33.55 per cent among those with a negative

reaction, and of 2.49 per cent among the vaccinated nurses. Finding that the probable mean error was only one-seventh of the actual difference between the two last-named groups, he declared it highly probable that the vaccination causes an effective immunity against tuberculosis. It was expected that injection of the B.C.G. would call forth the power of reacting to the Pirquet test, but even with large doses and in cases in which there was local infiltration the positive reaction did not always develop. With the smaller doses of 0.02 and 0.03 mgrm. barely one-half gave a positive reaction in the first two months. But even when the reaction remained negative the vaccination seemed to produce some immunity, as none of the nurses who gave a negative reaction after vaccination contracted the disease. The immunity, however, could not have been absolute, because when these nurses were subsequently exposed to infection they gave a positive reaction undoubtedly due to exogenous infection. The effect of the vaccine seems to be that the B.C.G. infection tends to produce a moderate immunity before the appearance of allergy manifested by the positive Pirquet reaction. This immunity is not strong enough, however, to prevent tuberculous infection, but it prevents the infection from becoming malignant and renders it benign, so that it acts like a new dose of vaccine increasing the antibody to a point where it gives an allergic reaction. This work of Heimbeck's has been given at some length as it throws new light upon the process of infection, and if confirmed would seem to point to new and effective methods of tackling the tuberculosis problem. There has been a tendency to regard infection and immunity in tuberculosis as something different from the same processes in other bacterial diseases, and this work brings tuberculosis into line with modern knowledge of other infections.

**INTRADERMAL TUBERCULIN TEST.**—Since Mendel and Mantoux, in 1908, introduced the intradermal tuberculin test, its advantages over other methods have been frequently pointed out. J. W. Lobban<sup>2</sup> discusses the prognostic significance of the test. Koch's old tuberculin is used and diluted with normal saline containing 0.4 per cent phenol. The dilutions employed were 1-1,000,000, 1-100,000, 1-10,000, and 1-1000. The skin of the flexor aspect of the forearm was the site chosen for the test, the injection being made with a 1-c.c. glass syringe and No. 214 hypodermic needle. The amount of the dilution injected was 0.2 c.c. The reactions were read forty-eight hours after the injection. A positive reaction showed infiltration and hyperemia about the site of the injection. The strengths of reactions were classified, + being an area of 1-inch diameter, ++ 2 inches, and +++ 3 inches. Commencing with a dilution of 1-1,000,000 each patient was tested, then with a dilution of 1-100,000, and so on until the patient showed a positive reaction: 108 tuberculous cases were examined and 69 controls. Although the number is small the results obtained suggested that the earlier the stage of disease and the less the degree of infection, the greater the dilution of tuberculin with which a positive reaction can be obtained. As the disease advances the patient fails to react to the greater dilutions, and lesser dilutions are required to produce a positive reaction. Further, it was apparent that when the intradermal test is repeated at intervals a more marked reaction occurs when the case is improving, and fails to appear or become positive with a lesser dilution when the case is retrogressing. It is thus a guide to prognosis. A test which becomes more marked in reaction, e.g., from + to ++ or +++, is of good prognostic value, whereas when a patient fails to react to the original dilution of tuberculin used and repeatedly fails to react with a lesser dilution the outlook is not hopeful.

**DIAGNOSIS.**—Older physicians laid great stress upon physical signs, which were elaborated with great refinement. Slight shades of difference in resonance on the lightest percussion, slight differences in the intensity or quality of the

breath-sounds, shrinkage of Kronig's bands, and so on, were stressed in the anxiety to make an early diagnosis. With the great improvement in X-ray pictures, and the knowledge that the apical lesions which are most easily discovered by physical examination are relatively benign, whereas the more serious subapical lesion may give no physical signs and only be revealed by X-ray

## X-RAY APPEARANCES IN PULMONARY TUBERCULOSIS.

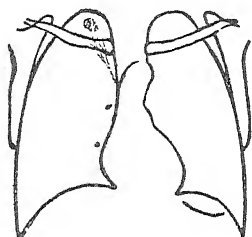


Fig. 107.—Healed true apical infection. No spread during four years' observation.

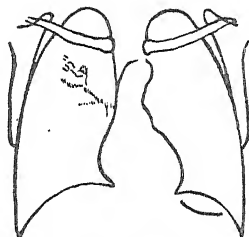


Fig. 108.—Three weeks from onset of cough. Previous health good. No tubercle bacilli found.

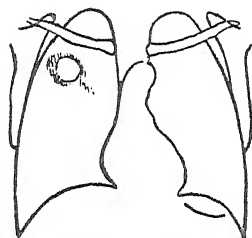


Fig. 109.—Skiagram six weeks from onset of symptoms. No T.B. found. (After induction of artificial pneumothorax one positive sputum was obtained. Thereafter no T.B. were found.)

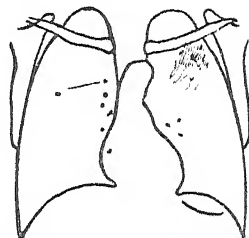


Fig. 110.—April 10: "Influenza." May 12: T.B. +. Skiagram of May 21 shows sub-clavicular mottling on left. No significant physical signs found on examination of chest. Note Glion's focus in right middle zone and numerous small calcified nodes.

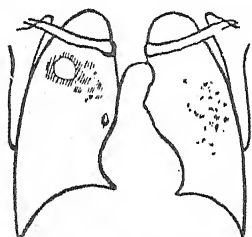


Fig. 111.—Large cavity in right subclavicular area. Physical signs: slight impairment of percussion note over right upper lobe and an occasional clicking rale below clavicle. No significant signs in right lung where skiagram shows tuberculous mottling.

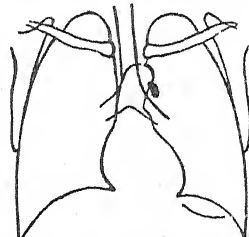


Fig. 112.—Calcified tracheobronchial gland.

(Figs. 107-112 by kind permission 'The Lancet'.)

examination, the modern physician lays most stress upon this as the most important method, as supplying more direct evidence. W. Burton Wood,<sup>3</sup> in a lecture on pulmonary tuberculosis in general practice, clearly describes the radiological pictures (Figs. 107-112). The modern skiagram shows the

cardiac shadow with clearly defined margins, the compact though ragged shadows of the glands and vessels of the lung roots, the trachea and its bifurcation, the bronchovascular shadows spreading into the lung fields like the branches of a tree, their subdivisions, till as slender as silk threads they reach their terminal ramifications. The lung parenchyma between these linea striae forms a delicate grey background against which any abnormality due to inflammation is easily detected.

Radiology has shown that the common onset of pulmonary tuberculosis is an area of bronchopneumonia situated below one or other clavicle and revealed as a small area of coarse mottling in the centre of which a circular clear area may often be seen, indicating breakdown of the lung tissue with resulting cavitation. This is the usual picture (*Figs. 108-111*). Less commonly heavier shadows in the lower lobe reveal basal tuberculosis. Occasionally a film shows supraclavicular shadows (*Fig. 107*) due to apical tuberculosis, a relatively benign form tending to heal spontaneously. Still more rare is the 'snowstorm' appearance due to miliary tuberculosis in which all areas exhibit a fine stippling. Radiology has shown that miliary tuberculosis is not inevitably fatal unless it is a part of a tuberculous septicaemia. Somewhat similar pictures are those of disseminated tubercle, which gives rise to coarser granular opacities, each of which may become calcified through fusion and breakdown. Radiology thus confirms the old teaching of Kingston Fowler that the first lesions of pulmonary tubercle are not usually apical, but are situated about one and a half inches below the summit of the lung. When first seen on the film such an area may be no larger than a sixpenny-piece, but its spread is often rapid, and within two or three weeks a considerable part of the upper lobe may be involved and cavitation have commenced as shown by a circular area in the centre of the mottling. In the early stage of infiltration physical examination may fail to reveal any significant physical signs. Even when cavitation has occurred the signs may be absent or slight. For practical purposes more than 50 per cent of cavities are absolutely or relatively silent, and if cavities are often silent it is obvious that areas of early infiltration may be equally so. If too much reliance is placed upon physical signs, we shall inevitably miss many cases of early disease at a time when treatment might be effective.

**Pregnancy and Tuberculosis.**—H. B. Matthews and L. S. Bryant<sup>4</sup> have studied the obstetric histories of 484 married women patients discharged from the Trudeau Sanatorium between 1916 and 1925. They were the survivors of a much larger group discharged during those years, as of 1018 women discharged 273 were dead by 1930. One-third of the 484 never became pregnant, and the remaining two-thirds became pregnant only about half as frequently as the average. The proportion of live births to pregnancies was also far smaller than normal. Losses just before or just after birth averaged 35 to every 100 living births as compared with 19 per 100 among the patients of birth-control clinics. Losses after birth, however, were infrequent: 287 bore 579 live children, and of these 556 were alive when their mothers reported. Of these, 501 were said to be normal and healthy, and in only 9 was tuberculosis found or suspected. Of the 287 mothers, 203 nursed their children, although most of their children were born after the mothers received sanatorium treatment. Of the 484 women, 218 were married before, and 266 after, they had contracted tuberculosis. One hundred and three women, roughly 1 in 3, connected their tuberculous condition with pregnancy. Of these, 38 reported onset of tuberculosis during pregnancy or shortly after childbirth, and, of these, 35 had first pregnancies. Severe relapse occurred in 33, 29 after childbirth and 4 after spontaneous abortion. Slight relapses occurred in 27. No bad effects were noted after any of the 80 artificial abortions, but there were

some onsets and recurrences after the 101 spontaneous abortions. Menstrual difficulties of some sort were reported by 47 per cent; 40 per cent had hard labours. The most striking feature was the relatively large number of post-partum hæmorrhages, this occurring in 13 per cent of the deliveries, as compared with an incidence usually of about 2 per cent. The women who waited for three years or more after leaving the sanatorium before becoming pregnant and who obeyed rules and regulations about their mode of life fared better than those who became pregnant earlier.

A. L. Stockler and E. Pitta<sup>5</sup> record the histories of 14 patients, 4 of whom were already pregnant, when submitted to **Artificial Pneumothorax**, the remaining 10 becoming pregnant while under treatment by artificial pneumothorax: 7 showed improvement and 7 became worse. Their conclusions are: (1) Pregnancy is no contra-indication for artificial pneumothorax; (2) Artificial pneumothorax increases the patient's resistance and enables her better to support the pregnancy and the puerperium; (3) Artificial pneumothorax seems to be most successful when pregnancy occurs in the course of pneumothorax treatment; (4) The induction of abortion is a dangerous measure which is rarely indicated in patients who have undergone artificial pneumothorax treatment. (*See also PREGNANCY AND ITS COMPLICATIONS.*)

**Sanocrysin.**—Møllgaard's original supposition that the effect of sanocrysin is due to a direct destruction of bacilli is not now maintained. The general opinion is that it stimulates the natural defences, possibly of the reticulo-endothelial system, so that the bacilli are rapidly phagocytosed, and also stimulates the formation of new connective tissue. As V. Stub-Christensen<sup>6</sup> points out, it is a characteristic feature of sanocrysin treatment that the bacilli are seen to disappear from the sputum after very few injections of small doses, and it would therefore seem improbable that the small amount should be able to destroy the bacilli so promptly. The formation of new connective tissue is seen markedly in the X-ray films taken before and after treatment. He has treated 438 cases, of which 384 were treated with sanocrysin as the only adjuvant. Of these, the percentage in which bacilli disappeared was 64. By way of comparison it is stated that the percentage was 33 for ordinary sanatorium treatment and 56 for ordinary treatment with artificial pneumothorax added.

A first series of 152 cases were treated with large doses—that is, a final dose of 1 gm. In these cases the initial dose in the first 77 was from 0.25 gm. to 0.5 gm., followed by doses of 1 gm. at an interval of from three to five days, up to a total of from 5 gm. to 7 gm. In the remainder the dosage was more cautious, the initial dose being 0.1 gm. and the increases more gradual, but the final dose was always 1 gm. In a second series of 232 cases the dose began with 0.05 to 0.1 gm. and rose to, but did not exceed, 0.5 gm., and in the last 75 cases did not exceed 0.3 gm. (under constant watch for possible reactions, so that the injections have not been repeated until every reaction from the previous injection has disappeared). If no reaction occurred, the intervals were three clear days between the first and second injections and four clear days between the other injections. The total dosage has usually been 4 to 5 gm., in none less than 2.5 gm. The results in the second series were much better than in the first, as the percentage of cases in which bacilli disappeared was 70 in the second series as compared with 55 in the first. This cannot be entirely due to the difference in the dosage, as with experience more suitable cases for treatment were selected. Complications in the first series were: albuminuria 84 per cent, intestinal disease 43 per cent, exanthema 39 per cent; and in the second series albuminuria 13 per cent, intestinal disease 3 per cent, and exanthema 10 per cent. The risk with small doses is therefore small. The albuminuria was quite slight and transient, and the exanthema was mainly

a disseminated efflorescence, often on the extremities, or a transient erythema of the roof of the mouth. The author calls attention to so-called *chrysiasis*. This was first described by H. Hansborg<sup>7</sup> in 1928, and consists of a characteristic slate-grey discoloration of the skin in patches where it is exposed to the light—that is, chiefly the hands and face—a discoloration resembling argyria and due to the precipitation of gold in the skin. The precipitation is permanent and of grave importance to the patient. Seven cases had this complication. In six in which the dosage was known the total doses were 13.5, 9.8, 6.25, 13.3, 8.8, and 8.9 gm. respectively. Reddish blonde persons are said to be particularly liable, and in them it may occur, but rarely, after a dosage of 6.25 gm. The percentage of patients fit for work five years after discharge was 54 for the sanocrysin-treated cases as compared with 37 per cent for those with sanatorium treatment alone. Sanocrysin was found to be of great benefit in support of collapse therapy, either given before treatment to clear up the better lung when this had been slightly affected, or when given together with the pneumothorax.

**Diet.**—D. Chalmers Watson<sup>8</sup> has been favourably impressed with the Gerson system. The essentials of this diet system are: (1) The all but complete exclusion of sodium chloride, a halogen-free vegetable kitchen salt preparation (**Eugusal**) being used as an effective substitute. (2) Fresh uncooked vegetables and fruit bulk largely in the diet, either in the form of vegetable extracts prepared by pressing uncooked vegetables, such as carrots, beet, spinach, and turnips, or in the form of salads; also fruit-juices similarly prepared by pressing and straining. (3) Marked restriction in the amount of flesh meat foods, 600 gm. weekly being allowed in Hermansdorfer's clinic, and Gerson allowing meat once or twice weekly. (4) Fresh uncooked milk, one pint or more daily, sour milk, eggs, especially yolks, oatmeal, wholemeal bread, and farinaceous foods in restricted amounts. (5) Various spices are used to increase the flavour of the dishes. The régime also includes two medicinal preparations: (a) **Mineralogen**, a special blend of mineral salts of vegetable origin; and (b) **A Phosphoric Acid, Cod-liver Oil Preparation**, both being administered thrice daily. Results of great value are claimed for the treatment of lupus, tuberculous disease of the bones and joints, and in the surgical treatment of pulmonary tuberculosis; but the evidence of its value in pulmonary tuberculosis not surgically treated has not yet been submitted. Gerson makes a claim for its benefit in a wide range of medical disorders, and Chalmers Watson saw much to substantiate this claim, as the results personally observed in the treatment of rheumatoid arthritis, cardiovascular degeneration, chronic skin conditions, asthma, and disorders of the central nervous system were of an arresting character.

REFERENCES.—<sup>1</sup>*Arch. of Internal Med.* 1931, June, 901; <sup>2</sup>*Tubercle*, 1930, Oct., 19; <sup>3</sup>*Lancet*, 1930, ii, 726; <sup>4</sup>*Jour. Amer. Med. Assoc.* 1930, Dec. 6, 1707; <sup>5</sup>*Brasil-Médico*, 1929, xliii, 890; <sup>6</sup>*Tubercle*, 1931, Nov., 49; <sup>7</sup>*Acta Tubercul. Scand.* 1928, iv, 124; <sup>8</sup>*Brit. Jour. Tubercul.* 1930, Oct., 194.

## TUBERCULOSIS, PULMONARY, SURGICAL TREATMENT.

A. Tudor Edwards, M.Ch., F.R.C.S.

The acceptance of the value of surgical measures in suitable cases of pulmonary tuberculosis is now evident by the enormous literature which is published throughout the world. In many series numbers are quite large enough to judge the types of cases which should be submitted to the various surgical procedures and to decide what eventual results may be expected from them.

W. Sachs<sup>1</sup> considers **Artificial Pneumothorax** as the method of choice in the treatment of pulmonary tuberculosis. He does not regard the danger of

empyema in this treatment as seriously as do other authorities, and has had no empyema in 800 cases of pneumothorax requiring 40,000 reinjections. Of 36 patients submitted to thoracoplasty, 19 were cured, 9 were benefited, 1 was unchanged. Three died within two years and 4 shortly after operation.

J. B. Amberson, jun.,<sup>2</sup> reviews 156 cases of pulmonary tuberculosis treated by artificial pneumothorax which had been discontinued five years before investigation. Of these, 89 show cavities permanently closed and healing good, and 56 able to work and lead normal lives. In 76 cases healing was incomplete, with cavitation still present. Only 35 of this group were still living. From his investigation he makes the deduction that the total duration of the treatment is not so important as the length of treatment after the cavities have become closed and the sputum negative. The average total length with successful results varied from two to three years.

T. von Naegeli and H. Schulte-Tiggess<sup>3</sup> give an account of the follow-up results of **Phrenic Evulsion** performed on 100 patients up to 1927. Out of 55 patients, in 17 (30.8 per cent) tubercle bacilli had disappeared from the sputum after two to four years, and they were able to do full work. These were all cases in which more or less isolated cavities were present, and in which a marked reduction or disappearance of the cavity had resulted by the end of the treatment. In a second group of 24 patients, 43.7 per cent showed a good result. These patients had fairly large cavities, with scattered disease in the surrounding lung and adhesions in the neighbourhood and to the diaphragm. Likewise in these there was definite clearing of the cavities, in some of which they were completely collapsed. All these cases, however, still had bacilli in the sputum, but many were able to do light work. The remaining 14 patients were worse. The cavities were not diminished, and in many cases were larger. One of these was dead, and in a majority the disease had extended in the opposite lung. None were able to work. In 6 the diaphragm was only a little or not at all raised, probably due to the nerve being torn above its junction with the accessory branches.

H. Wilson<sup>4</sup> gives a full account of the results of phrenic evulsion in 200 cases of chest disease, and among his conclusions states the following: (1) Untoward symptoms after the operation are rare. (2) Phrenic evulsion is a valuable adjunct to thoracoplasty. (3) In cases of artificial pneumothorax, where pulmonary collapse is unsatisfactory because of basal diaphragmatic adhesions, phrenic evulsion is valuable in procuring better collapse, and in cases where refills have to be given frequently the operation lengthens the intervals between them; its value in reducing the incidence of pleural effusion in these cases is doubtful. (4) In bronchiectasis the combination of artificial pneumothorax and phrenic evulsion is disappointing; considerable improvement occurs in only a minority of patients; factor is lessened more than the amount of the sputum. (5) In pulmonary tuberculosis phrenic evulsion has a beneficial action on the local lesion and on toxæmia; a similar effect is produced on hæmoptysis, but a better effect on the amount of sputum. (6) Phrenic evulsion is of value in assisting drainage of lung abscess and interlobar empyema. (7) Phrenic evulsion should be considered in the treatment of pain due to pleural adhesions and as a palliative measure in the treatment of pleuro-pericardial adhesions.

A. Wirth and G. K. von Jaski<sup>5</sup> give their experiences with 600 phrenic operations. In 502 cases an isolated exeresis was done. Of 385 cases, 102 were closed. Of 420 operated upon, improvement resulted in 349, and there was no change in 71. They record unfavourable results in the form of activation on the opposite side in 1.5 per cent cases. They sum up their conclusions as follows: (1) The indication for phrenic evulsion is presented only in cases in which



conservative therapy has proved inadequate after a sufficiently long trial. (2) In cases in which the indication for pneumothorax is established, including the vital indication of uncontrollable hæmorrhage. Evulsion of the phrenic nerve is equally justified for disease processes in the lower, middle, and upper lobes, for breaking down early infiltration, and for tertiary nodular cirrhotic cavernous disease. It is preferred to pneumothorax because: (a) It is a single intervention; (b) It is less dangerous; (c) It causes less interference with the patient's occupation. (3) Pneumothorax should be considered in those cases in which evulsion is followed by no noteworthy improvement. Where this fails, thoracoplasty is indicated. (4) In cases of expanding lung during pneumothorax treatment, or in those in which the pneumothorax has not produced a sufficient effect, the phrenic evulsion is indicated. (5) In pyopneumothorax and empyema evulsion should be carried out previous to thoracoplasty.

In consideration of all the medical, social, and economic factors, the authors recommend, in contrast to the indications recognized formerly by the majority of lung specialists, the following sequence of procedure: (1) Evulsion of the phrenic nerve; (2) Attempt at pneumothorax; (3) Thoracoplasty.

M. Ernst<sup>6</sup> discussed the cause of failure in seven patients who were supposed to have had a phrenic evulsion and in whom, on radiological examination later, the diaphragm was shown to be moving well. In four, the nerve was found at the second operation in its normal position with undisturbed surroundings. In two, abnormal conditions were responsible (variation in the musculature of the neck or abnormal position of the nerve). The remaining case had shown paralysis of the diaphragm for several months, and further operation disclosed another nerve (double phrenic).

J. Alexander<sup>7</sup> states that an increasing number of surgeons prefer diaphragmatic paralysis to pneumothorax, especially for unilateral lesions in which the cavities are such that phrenicectomy can be expected to close them, and that it has the advantage that a single procedure replaces the numerous injections. He also advises temporary interruption of the phrenic nerve in cases of pulmonary hæmoptysis, for certain types of chronic tuberculosis, especially in old people. Alexander advises intercostal neurectomy in the latter instead of thoracoplasty, basing his experiences on the results of six cases.

In a discussion<sup>8</sup> on the surgical treatment of pulmonary tuberculosis held in Norway in 1930 Bull opened by stating that his remarks were based upon 401 cases of **Thoracoplasty** operated upon by himself or his Norwegian colleagues. The ulcero-fibrous type of tuberculosis, mainly unilateral or with limited inactive disease on the other side, gives the best chance of cure. The results show 35 to 45 per cent cured and able to perform full work, 20 per cent receive temporary improvement but relapse, 16 per cent derive no benefit, and 10 per cent die within eight weeks of operation. Sauerbruch reports 40 per cent cures in 1200 operations, but 75 to 80 per cent are cured when the disease is strictly unilateral. The operative mortality is 4 to 5 per cent. **Apicolysis** by wax implantation has not given satisfaction in bilateral cases. Sauerbruch reserves the operation for apical cavities with a relatively small secretion or for those cases in which previous thoracoplasty has failed to collapse them. In cases of secondarily infected pyothorax an extrapleural thoracoplasty is succeeded by a second operation in which the pleural cavity is drained by siphon drainage. Open operation for the division of adhesions preventing complete collapse of the lung in artificial pneumothorax is advocated. [This is against the general opinion, and there is grave risk of secondary empyema and fistula.—A. T. E.]

Gravesen, at the same discussion, in general agreed with Bull and Sauerbruch, and stated that in 211 patients there was an operative mortality of 7.6 per cent, with 45 per cent able to work, and almost all free from bacilli one to thirteen years after operation.

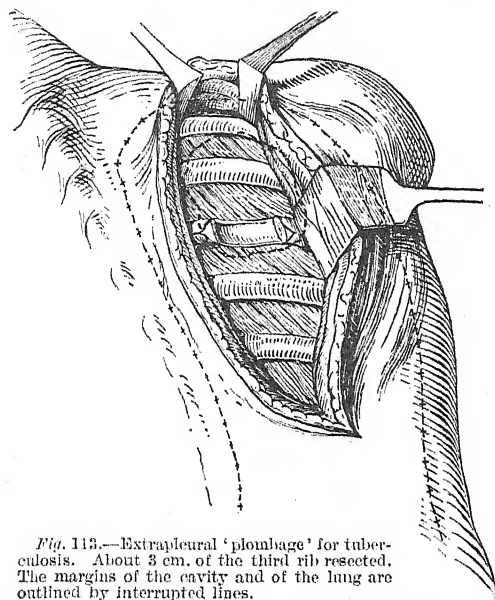


Fig. 113.—Extrapleural 'plombage' for tuberculosis. About 3 cm. of the third rib resected. The margins of the cavity and of the lung are outlined by interrupted lines.

(Figs. 113-116 by kind permission of 'Surgery, Gynecology, and Obstetrics'.)

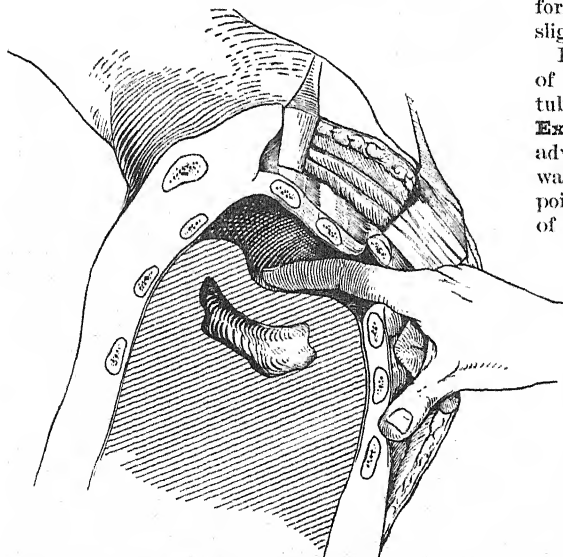


Fig. 114.—Transverse section used in pneumolysis. The finger is placed between the pleural induration and the thoracic wall.

P. K. Brown<sup>9</sup> states that while the large cavities may close entirely as the result of postural rest, pneumothorax, phrenicectomy, or intrapleural pneumolysis (Jacobæus), thoracoplasty should not be postponed too long in cases in which they fail to close under such treatment and in which there are constantly recurring hæmorrhages. The deformity from complete unilateral thoracoplasty is neither an æsthetic nor an economic handicap. Alexander says that this should not be considered in a discussion of the relative merits of thoracoplasty and multiple intercostal neurectomy, for when thoracoplasty is performed properly it is very slight.

R. Nissen,<sup>10</sup> in an account of the surgical treatment of tuberculous cavities with **Extrapleural Plombage**, advises the use of paraffin wax of a definite melting-point; complete obliteration of the pleural space is essential before the operation is attempted, and it is imperative that pneumothorax is attempted before the operation is undertaken. Another essential is that the wall of the cavity be strong enough to withstand the pressure of the paraffin, as otherwise pressure necrosis is likely to result and cause the wax to be evacuated into the

cavity and coughed up in small pieces. As regards indications, if one half of the lung is involved and the other half is not in a condition to bear total obliteration of the diseased side by thoracoplasty, the obliteration of the cavity of the upper portion will eliminate the infection and the danger of aspiration. The obliterating material excludes only a small amount of the breathing lung tissue, and this operation can be carried out in patients too old for thoracoplasty. Severe recurrent hemorrhage is another indication for this type of treatment. (*Figs. 113-116.*)

F. Bérard and R. Denis<sup>11</sup> advocate the more extensive use of **Apicolysis** in the treatment of apical cavitation resulting from tuberculosis. They advocate an anterior rather than a posterior approach for such reasons as the greater efficiency in the separation of the lung and pleura from the chest wall, the diminished risk of damage to important mediastinal structures, and the greater possibility of infection in the deep posterior wound. Bérard<sup>12</sup> also gives an account of four cases treated with very satisfactory results by his method of apicolysis.

F. G. Chandler<sup>13</sup> describes an instrument for thoracoscopy and adhesion cutting. In this, a large cannula is introduced, through which a viewing thoracoscope is inserted, withdrawn, and replaced by another

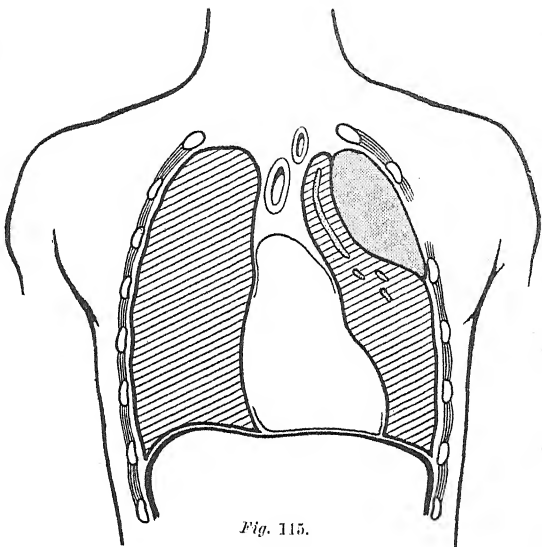


Fig. 115.

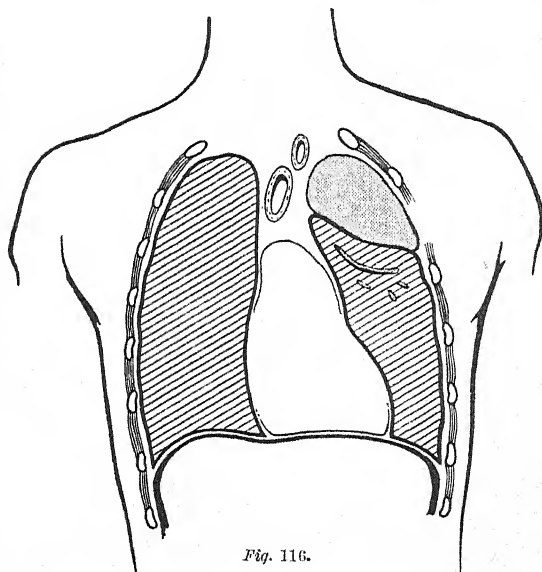


Fig. 116.

*Figs. 115, 116.*—Sketches showing the effects of paraffin filling (plombe) on a cavity of the left lung. *Fig. 115* shows that the filling exerts lateral pressure from the side; *Fig. 116* that the filling exerts pressure from above.

which permits of anæsthetization of the pleural end of the adhesion. A combined telescope and diathermy terminal then replaces the anæsthetic portion of the instrument, and the adhesion, after coagulation, is divided by a cutting diathermy wire. The advantages of this instrument are a single puncture instead of two, and the combination of coagulating and cutting instruments together. The disadvantages are: (1) The necessity for very accurate localization before operation; (2) A larger cannula has to be introduced; and (3) The field of vision when most required, i.e., during the coagulation and division of the adhesion, is most restricted, by the necessarily small size of the telescope.

In subsequent communications Chandler mentions certain modifications of the instrument and a method of determining radiologically the position of the adhesions relative to the axillary line. Another point mentioned is the difficulty resulting from over-coagulation, and lastly,<sup>14</sup> the value of the electro-cautery in the division of string adhesions.

G. Maurer,<sup>15</sup> in a paper on the surgical treatment of adhesions interfering with artificial pneumothorax, divides these intrapleural bands into four groups: (1) Adhesions of which neither the pulmonary nor pleural insertions are expanded; their division is simple but its therapeutic effect illusory. (2) Adhesions with the thoracic end broadened; therapeutic effect of division is better but they are uncommon. (3) Adhesions with pulmonary attachment conical. This type is frequently encountered, and the pulmonary end contains drawn-out lung tissue or cavity. The division is accountable for the occurrence of post-operative empyemata. If no complications result, the best therapeutic effect follows the division. (4) Adhesions in which both thoracic and pulmonary ends are expanded—hour-glass. They are less dangerous than the former group, and the most important adhesions belong to this group. With a view to avoiding damage to the lung and the occurrence of secondary empyemata following the division of adhesions under thoracoscopic control, Maurer divides the attachment of the adhesions to the chest wall by a galvanic current to prevent hæmorrhage, an operation which he terms 'enucleation'.

REFERENCES.—<sup>1</sup>*Beitr. z. Klin. d. Tuberk.* 1930, lxxiv, 254; <sup>2</sup>*Ann. of Internal Med.* 1930, iv, 343; <sup>3</sup>*Munch. med. Woch.* 1930, Nov. 28, 2061; <sup>4</sup>*Med. Jour. of Australia*, 1930, Oct. 11, 487; <sup>5</sup>*Surg. Gynecol. and Obst.* 1930, Sept.; <sup>6</sup>*Deut. Zeits. f. Chir.* 1931, June, 449; <sup>7</sup>*Ann. of Internal Med.* 1930, iv, 348; <sup>8</sup>*Presse méd.* 1930, Oct. 1, 1332; <sup>9</sup>*Ann. of Internal Med.* 1930, iv, 361; <sup>10</sup>*Surg. Gynecol. and Obst.* 1931, March, 732; <sup>11</sup>*Presse méd.* 1930, Nov. 5, 1497; <sup>12</sup>*Lyon chir.* 1931, July-Aug., 500; <sup>13</sup>*Lancet*, 1930, ii, 74; <sup>14</sup>*Ibid.* 1931, i, 971; <sup>15</sup>*Ibid.* 1930, i, 72.

## TUBERCULOSIS, SURGICAL. (See also TUBERCULOSIS OF JOINTS.)

John Fraser, Ch.M., F.R.C.S.Ed.

DIAGNOSIS.—S. Behrman<sup>1</sup> draws attention to the fact that a certain proportion of psoas abscesses are non-tuberculous in type, and non-spinous in their source of origin. Four such cases have recently been observed. Pronounced psoas irritation with limp and flexion of the hip were the striking features, and a staphylococcus was found to be the causative organism. Behrman discusses the differential diagnosis; it implies a consideration of appendicitis, arthritis of the sacro-iliac joint, lower pole perinephric abscess, and hip-joint disease.

The difficulties encountered in establishing the tuberculous nature of a doubtful joint were discussed at the annual meeting of the Westphalian Surgical Society at Essen last year. Keppler,<sup>2</sup> of Essen, opened the discussion, and mentioned the following points:—

1. *Examination of the Joint Fluid.*—The demonstration of tubercle bacilli is, of course, conclusive evidence, but even if this evidence is absent, the cytological character of the fluid affords valuable assistance.

2. *Biopsy and Animal Inoculation*.—While making use of this procedure in any doubtful case, he found the percentage of error to be from 5 per cent to 30 per cent.

3. *Hohn's Culture Test*.—This investigation was always combined with the examination of the joint fluid, or the biopsy of the excised material. Keppler considers this method of investigation a valuable one, and the reviewer has found a number of references to the value of the test in German literature.

4. *Tuberculin Tests*.—It was considered that in children up to the age of 5 years the cutaneous reaction test afforded valuable evidence; in older children the subcutaneous injection of a sufficiency of tuberculin to induce a focal reaction was considered the most important diagnostic means at our command.

5. *X-ray Examination*.—While using this method as a routine, Keppler has recorded that in early cases the information which it affords is inconclusive, and that it does not afford really helpful evidence in the commencing case, where early diagnosis is so important and often so difficult.

6. *Special Methods*.—Under this heading Keppler discussed the Wassermann complement-fixation test, the Wildholz urine reaction, the blood picture, and the sinking-rate of the red corpuscles. He considered the last as the most reliable of the special tests.

TREATMENT.—C. F. Painter<sup>3</sup> voices a protest against the increasing tendency in America to employ ankylosing operations (presumably extra-articular) in early tuberculous joint lesions. To the majority of surgeons in this country it will come as a surprise to learn that conditions justify the warning. The difficulties of early diagnosis are so great, and the results of conservatism relatively so good in commencing cases of the disease, that the number of those who favour ankylosing operations in this class must be—in this country at least—relatively small.

Two articles convey reports on special methods of treatment. From time to time **Radium** has been employed in surgical tuberculosis, and, very particularly, in glandular disease. K. Volkmann<sup>4</sup> has also published the results of **Mesothorium Irradiation** in bone and joint tuberculosis. He uses radium element enclosed in silver tubes; in a lesion of average size six tubes are used, and they are so distributed that a single large tube containing 61.5 mgrm. overlies the centre of the lesion, while five smaller tubes, each containing 12 to 13 mgrm. of radium element, are disposed at equal distances around the periphery. The radium tubes are fastened to a gauze foundation, and the filtration consists of 0.2 mm. of silver and 1 mm. of brass, with a separation filter of gauze 1 cm. thick. The time factor varies according to the character of the lesion and the radio-sensitivity of the individual; Volkmann recommends two hours' irradiation as a minimum and four hours as a maximum. The application may be repeated two to four weeks after the original treatment, the time interval depending on the degree of reaction displayed. Volkmann has evidently been favourably impressed by the value of this method, but he adds, "It goes without saying that the mesothorium radiation is no universal cure for surgical tuberculosis, and therefore it need not be pointed out that some kind of surgical treatment may be required as necessity demands. Thus, bone and tissue sequestra must be removed, caseous masses incised, abscesses aspirated, and sinuses injected." Full tables of results are given: 137 cases came under review, 85 being examples of joint and glandular tuberculosis and 52 of bone tuberculosis. The percentage of cures was high, though some of the cases required minor operative interference.

The treatment of bone tuberculosis by large amounts of **Vitamins** is the subject of a paper by C. L. Pattison.<sup>5</sup> Recognizing that benefit accrues in septic conditions from the administration of vitamin A, that the value of

cod-liver oil largely depends on its vitamin content, and that bone calcification is partly controlled by vitamin D. Pattison has investigated the possibilities of improvement in bone tuberculosis by the administration of large doses of vitamins A and D, the latter in smaller proportions than the former. Two preparations manufactured by the British Drug Houses Ltd. were used. In No. 1 the vitamin A was in such proportions that it gave 150 blue with the antimony trichloride test, and so twenty times the vitamin-A potency of cod-liver oil; it also contained 10,000 anti-rachitic units per c.c. (Coward). No. 2 preparation contained double the vitamin A content of No. 1 (300 blue), but only 100 anti-rachitic units per c.c. The dosage and control arrangements were as follows: 43 patients were submitted to the intense vitamin therapy, while 35, acting as controls, were given 10 c.c. of cod-liver oil daily. The dosage was arranged on the following plan: Group A (15 patients) received 7.8 c.c. of preparation No. 1 daily for 3.5 months and 9.4 c.c. of preparation No. 2 daily for 3.4 months; Group B (28 patients) were given 9.6 c.c. of preparation No. 2 for a period of 4.1 months. Pattison summarizes the results as follows. Of 43 patients submitted to the intense vitamin therapy, 32 showed clinical improvement, while 11 were not benefited. In 25 of the 43 cases there was local arrest of the disease, and increased calcification evident on X-ray examination, the remaining 18 cases showing no radiological evidence of improvement.

Pattison's paper is an interesting and a suggestive one, but it is open to the criticism that no information is given regarding the use of coincident conservative treatment in the cases under observation, and it is obviously difficult to assess the degree of benefit which may be ascribed purely to the vitamin therapy.

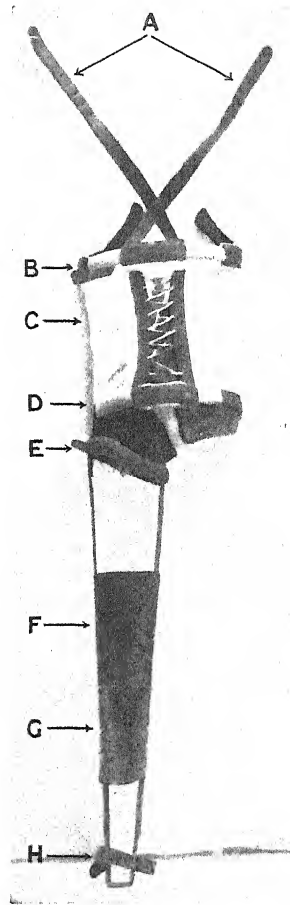
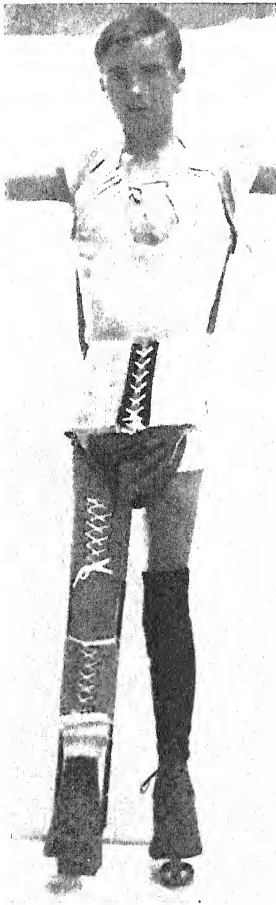
The **Robertson-Lavalle Treatment** of bone and joint tuberculosis by slender epiphysial and peri-articular bone-grafts has been reviewed in the MEDICAL ANNUAL on several occasions. It is evident that interest in the method has declined, and stringent criticisms of its technique and results have been forthcoming. O. Appreduzzi and L. Biancalama<sup>a</sup> have published their experience of the method. They have modified the procedure in certain respects, and regard these modifications as an improvement on Lavalle's original method. It will be recalled that Lavalle recommended the introduction of small pencil-like bone-grafts into the epiphysis and the peri-articular spaces, the benefits claimed being said to arise as the result of cancellous drainage, of stimulus of ossification, and of increased calcium exchange. While the results originally claimed by Lavalle have not been confirmed, it is agreed that the operation relieves bone and joint pain, and appears to stimulate the ossification of a rarefied bone. The present authors have modified the Lavalle technique in so far as, while they employ the original method in early cases, a trans-articular graft is used when the disease is more advanced. The graft is 1 cm. thick, considerably longer than that employed by Lavalle, and passes through the opposing bone surface and so bridges the joint. It is virtually, therefore, a type of intra-articular arthrodesis.

Thirteen cases are reported in the present series, 5 of hip disease, 7 of knee, and 1 of ankle. The authors regard the results as satisfactory, though to the reviewer they appear no better than those of purely conservative methods. It has hitherto been thought that trans-articular grafting resulted in early absorption of that portion of the graft which lies in the free joint space; the present authors deny this possibility, though all the weight of experience is against their contention. It is unlikely that the suggested modification has any real advantage, for the ultimate aim of the successful operation must be an arthrodesis, and it would seem that this can be best secured by the extra-articular method originally introduced by Hibbs.

# PLATE LXIX

## TUBERCULOSIS OF THE HIP

(M. FORRESTER-BROWN)



Forrester-Brown's splint for tuberculosis of the hip-joint; front and back view (note laced canvas). A, Shoulder straps; B, Upper cross-bar; C, Abdomen corset; D, Lower cross-bar; E, Caliper ring; F, Thigh corset; G, Leg corset; H, Heel strap.

*By kind permission from M. Forrester-Brown's  
'Deformities in Infancy', Oxford Medical Publications*





The efficiency of **Hip Splintage** is discussed by M. Forrester-Brown.<sup>7</sup> Her article contains a number of features of general interest, the discussion ranging over such matters as difficulties in diagnosis, the part played by operation, and the special methods of splintage recommended by the author. In relation to diagnosis the ever-recurring problem of the early case is alluded to, and two are put forward: Should we wait until signs are sufficiently definite to render the diagnosis certain, or should treatment be embarked upon as soon as there is the earliest suspicion of a morbid change? The disadvantages attached to both possibilities are apparent, and the author does not indicate what her choice would be; we may infer from the context, however, that she favours the latter. Certain pathological types are then discussed—the extra-articular focus situated in the neck of the femur, the rapid general invasion of the synovia, the insidious subchondral type beginning in the upper part of the acetabulum and associated with early subluxation of the femoral head. From the general pathological standpoint each of these types may be considered as demonstrating three stages—active invasion with little tissue resistance, a phase of increasing tissue reaction, and a stage of true tissue healing. The sequence of treatment recommended is subdivided into two stages. During the first or active stage there is complete recumbency in the open air, with minimum fixation of the hip. At this time particular attention is paid to observing the accepted general methods of treatment. When the signs of activity of the disease have subsided, the second stage is embarked upon; it implies the resumption of a gradually increased activity and weight-bearing, and it is now that the author's special splint is employed. During the first or active stage the author recommends that Pugh's extension system be followed, and if for any reason this should prove unsuitable, the Jones abduction frame is advised. In the second or quiescent stage the procedure varies according to the condition; if joint movement is present, an increasing activity in bed is permitted for three months, at the end of which time the patient is allowed to begin walking, using the author's special splint. If the hip is stiff, there is a choice of possibilities: (1) To follow the lines adopted in the case of the movable joint; (2) To allow the patient to move about using an ambulatory splint; or (3) To put the limb in plaster for three or six months, after which an ambulatory splint is fitted. If relapse occurs in a case which appeared to be convalescent, the author recommends an extra-articular arthrodesis by the Hibbs technique, or by her own special modification.

These details are introductory to the description of the splint which the author recommends in the ambulatory stage of the treatment. The special details are shown in *Plate LXIX*. She insists that the splint is not a corrective one, but essentially supporting.

E. D. Telford<sup>8</sup> gives us an excellent summary of the **End-results** of 170 cases observed in a single institution over a period of twenty-six years. The cases were grouped as follows: 67 spines, 71 hips, 32 knees; all were discharged within the period 1906-24 with the comment 'apparently cured'. Of these cases 129 have been traced: the results are tabulated as follows:—

	CASES
In good health and capable of doing active work ..	110
Complete arrest of disease, but poor functional result ..	7
Original disease still active, or other form of tuberculosis existent .. .. .	6
Died since discharge .. .. .	6

These results must be considered as highly satisfactory, and the author may regard them as a triumph of conservatism; a mortality figure of 4.6 per cent in a series of cases which extends over twenty-four years must be among the lowest percentage ever recorded.

The end-results of hip tuberculosis are discussed by D. S. O'Connor.<sup>9</sup> Allusion is made to the ever-present difficulty of diagnosis of the early suspicious case, and in the series under review 54 cases out of 189 (28 per cent) were erroneously diagnosed as tuberculous. An interesting table is given of the conditions which formed the source of diagnostic error, and the significant statement is made that "except one case of chronic arthritis, all recovered within a few weeks or a few months with a normal, or nearly normal, range of movement, in contrast to 54 out of 67 tuberculous cases which had either no movement at all, or at the most 10 per cent of flexion." Similarly, there is a striking contrast in relation to deformity: "only one of the non-tuberculous cases showed deformity, while 58 out of 67 tuberculous cases had a measurable amount of flexion."

The method of treatment adopted in the tuberculous case consisted of fixation on a Bradford abduction splint, with traction until such time as acute symptoms had subsided. The child was then sent home on crutches; if flexion tended to appear, a short plaster spica was applied. The period under review was the decade 1915-24, and the results were as follows. Out of 67 cases, 18 showed active tuberculosis, 4 showed ankylosis of both hips, 20 demonstrated bony ankylosis of the affected side, and in 31 cases there was a fibrous ankylosis; there was a mortality of 15 per cent. These figures do not bear comparison with those of Telford, and one cannot help feeling that the scheme of treatment which O'Connor outlines is open to criticism, and that its imperfections are responsible in some measure for the unsatisfactory results which he records.

K. Rummelhardt<sup>10</sup> reports on a series of 178 cases of spinal tuberculosis. The paper contains a full analysis of results and complications, and illustrates the extreme seriousness of this disease, undoubtedly the most grave of all forms of surgical tuberculosis. Nervous complications are reported in 40 per cent of the cases, abscess formation in 60 per cent, while the mortality in all cases was 50 per cent. These figures appear unduly serious; they are not representative of the results accepted in this country, and possibly they are in some measure explained by the recent stringent economic conditions in the country from which they emanate.

REFERENCES.—<sup>1</sup>*Lancet*, 1930, ii, 297; <sup>2</sup>*Zentralb. f. Chir.* 1930, Oct. 4, 2493; <sup>3</sup>*New Eng. Jour. Med.* 1930, Oct. 16, 787; <sup>4</sup>*Zentralb. f. Chir.* 1931, Feb. 28, 540; <sup>5</sup>*Brit. Med. Jour.* 1930, ii, 178; <sup>6</sup>*Presse méd.* 1931, Feb. 18, 242; <sup>7</sup>*Brit. Jour. Surg.* 1930, July, 54; <sup>8</sup>*Brit. Med. Jour.* 1930, ii, 812; <sup>9</sup>*New Eng. Jour. Med.* 1930, Sept. 25, 636; <sup>10</sup>*Arch. f. klin. Chir.* 1930, July, 771.

## TUBERCULOUS PERICARDITIS. (See PERICARDITIS, TUBERCULOUS.)

### TULARÆMIA.

J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—According to H. S. Cumming,<sup>1</sup> the three principal modes of transmission of tularæmia in the United States are the bites of ticks, the bites of flies, and the dressing of wild rabbits. Cases due to rabbits occur during the hunting season, viz., November to January for the cotton-tail rabbit and April to October for the jack rabbit. Cases due to ticks occur between March and August and are caused by *Dermacentor andersoni* or ticks whose species has not been determined. Cases due to flies occur between June and September, when house-flies are most prevalent. Of 420 cases of tularæmia hitherto notified in forty-three States of the U.S.A., 17 have proved fatal—a mortality of about 4 per cent—but these figures probably represent only a small proportion of the real number of cases and deaths.

Tularæmia was unknown in Norway until the autumn of 1929, when it was first discovered by Thjøtta (see MEDICAL ANNUAL, 1931, p. 490). K. W. Wefring<sup>2</sup> points out that the infection in each case had been caused by hares,

and that the patients were hunters, housekeepers, cooks, or game merchants. He agrees with Thjotta in regarding the disease known as 'lemming fever', due to pollution of drinking-water by the bodies and excreta of the lemming, as being probably related to tularemia.

Doubrowsky<sup>2</sup> points out that it is only within the last two or three years that tularemia has become well recognized in Soviet Russia (*see* MEDICAL ANNUAL, 1931, p. 489), although it is probable that an outbreak of pestiform lymphadenitis which occurred in the Astrakhan district in 1877 was one of tularemia. Since then numerous epidemics have occurred in Russia, especially in 1921, 1926, 1927, and 1928, usually commencing in May and June and then rapidly subsiding, although isolated cases might occur in September or even November. The outbreaks as a rule were confined to the immediate neighbourhood of rivers or spring floods. Males between the ages of 10 and 30 were almost exclusively attacked. The great majority of the patients had come into close contact with water rats, especially by hunting them.

REFERENCES.—<sup>1</sup>*Bull. off. internat. d'Hyg. publ.* 1930, 1904; <sup>2</sup>*Ibid.* 1908; <sup>3</sup>*Ibid.* 1911.

### TYPHOID FEVER. (*See also* PARATYPHOID FEVERS; PYREXIA, CONTINUED.)

J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—According to the Monthly Epidemiological Report of the Health Section of the League of Nations,<sup>1</sup> no pronounced change has taken place in the incidence of typhoid fever during the period 1922–30 in Germany, England, or Poland, apart from a slight decline in March and April, when typhoid morbidity was lowest. In the United States there was a steady decrease in the incidence of typhoid, the disease being most prevalent in the Southern States. In France there has been a distinct fall in the frequency of the disease during the triennium 1928–30. In Italy the number of cases has remained stationary. In Soviet Russia there was a great increase in the morbidity in 1929, especially in the Ukraine and Siberia. In 1930 defective sewerage gave rise to a considerable epidemic in Leningrad. With the exception of Spain and Hungary, where the reduction has been least pronounced, there has been a universal and striking decline in typhoid mortality in the last ten years. This decline is mainly due to the striking improvement in the water-supply and to a certain extent to anti-typhoid inoculation of a large proportion of the male population during the War and the continuance of the practice with military conscription. Since the War both the incidence and case-mortality have been higher in women among whom inoculation has not been carried out than among men.

The nineteenth annual report of the *Journal of the American Medical Association*<sup>2</sup> on the cities of the United States with a population of more than 100,000, of which there were ninety-three in 1930, shows that the total typhoid mortality in 1930 in the seventy-eight cities for which records are available is almost exactly the same (1·61) as that for 1929 (1·59). Similar halts in the steady diminution of typhoid mortality have been noted three times previously in the past twenty years, viz., in 1913, 1921, and 1925.

Moutel,<sup>3</sup> who records 23 cases of typhoid fever in native soldiers stationed in France, comes to the conclusion that typhoid fever, though rarer than in the white races, does not spare the coloured race, and that in the presence of persistent and continued fever in native soldiers stationed in France the possibility of typhoid fever should be considered.

E. F. Vialatte and R. L. F. Bolzinger<sup>4</sup> record their observations on 200 cases of enteric fever which occurred from Oct. 1, 1927, to April 30, 1929, in the garrison at Fez, which has always been one of the principal endo-epidemic centres in Morocco. Eleven died—a mortality of 5·5 per cent. The

disease in most cases was due to faecal contamination of the water-supply. The race-distribution and varieties of enteric were as follows: Europeans, 115 cases with 4 deaths; Algero-Tunisians and Moroccans, 84 cases with 8 deaths; Senegalese, 1 case; typhoid fever, 117 cases with 10 deaths; paratyphoid A, 71 cases with 1 death; and paratyphoid B, 12 cases with no deaths.

J. Durich<sup>5</sup> describes an epidemic of 287 cases, with 18 deaths, which occurred at Santa Margarita in the Balearic islands, between July 20 and Oct. 30, 1928, and was caused by consumption of ice-creams probably infected by the water used in their preparation or by a carrier. In over 50 cases consumption of the ice-creams was immediately followed by gastro-enteritis, the symptoms of typhoid developing later.

ETIOLOGY.—E. S. Wing and D. V. Troppoli,<sup>6</sup> who record a case of *intra-uterine transmission of typhoid fever*, remark that though numerous previous examples have been reported their case is the only one on record in which a mother convalescent from typhoid fever gave birth to a convalescent baby with a positive Widal reaction (1 in 20) and typhoid bacilli in the stools. Cultures of the mother's breast milk were repeatedly negative.

SYMPTOMS AND COMPLICATIONS.—A. Villarama and J. S. Galang<sup>7</sup> record their observations on 64 cases of *typhoid fever in pregnancy* admitted to the Philippine General Hospital from 1917 to November, 1929. Although typhoid terminated pregnancy in about 78 per cent of the cases, the termination of pregnancy did not cut short the disease, as is shown by the fact that the temperature dropped after delivery but returned to its usual level several hours afterwards. There were 21 foetal deaths, or 60 per cent of the total births, and 19 living babies. The maternal mortality amounted to 20 cases, 11 occurring in pregnancy and 9 in the puerperium.

L. F. Defaix<sup>8</sup> remarks that *retention of urine* may occur at any stage and in any form of typhoid fever. Previous disease of the urethra or bladder and physical or moral strain probably play a part in its occurrence. The complication does not appear to indicate a particularly severe attack except when it develops at an early stage. It should be treated by the application of compresses to the hypogastrium, **Opium** by mouth or enema, or subcutaneous injections of **Pilocarpine Hydrate** (1 cgrm.) or **Pituitrin** (1 to 2 c.c.). If these measures fail, a catheter should be passed daily.

P. Voignier<sup>9</sup> records three cases in patients aged 15, 19, and 36, of *pulmonary infarction secondary to phlebitis* in typhoid fever. Two died and one recovered after an illness of three months. Although pulmonary embolism is a rare complication of typhoid phlebitis, the possibility of its occurrence rendering immobilization as necessary as in other forms of phlebitis must be borne in mind. It may give rise to sudden and rapid death and should always be looked for post mortem in typhoid patients who have died suddenly. The prognosis should be very guarded owing to the patient's diminished resistance, and especially the myocardial involvement.

H. Bailey<sup>10</sup> records three cases in a woman aged 38, a boy aged 14, and a man aged 30, in whom *abdominal pain* and alarming rectal *haemorrhage* were the first symptoms of typhoid fever. The man and woman recovered and the boy died.

A. Wajsmann<sup>11</sup> illustrates the rarity of *cholecystitis in children* suffering from typhoid fever by the fact that he could find only 35 cases in the literature between 1835 and 1930, in 15 of which anatomical proof of perforation was found. The onset may resemble intestinal perforation or may suggest cholecystitis from the first. In the absence of operation the mortality from typhoid perforation of the gall-bladder in children is 87.5 per cent, but when operation

is performed even late, recovery takes place in 62.5 per cent. **Cholecystotomy** appears to be the most suitable operation, as it is the simplest to perform, takes the shortest time, allows drainage of the gall-bladder, and prevents re-infection of the intestine.

H. Gounelle<sup>12</sup> states that out of 320 soldiers inoculated with T.A.B. vaccine, 70 developed *herpes facialis*, and adds that about a dozen cases of herpetic keratitis following the use of this vaccine have been described by ophthalmologists.

TREATMENT.—J. Martin<sup>13</sup> while maintaining that **Rodet's Serum** (see MEDICAL ANNUAL, 1931, p. 493) constitutes a specific treatment for typhoid fever, admits that its action is not absolutely constant, as it is essential that it should be given before the temperature has reached 104°, and the typhoid state has set in. In many cases the serum cuts short the disease, and it almost always attenuates the symptoms and reduces the number of complications. Serum sickness is constant, but is not sufficiently severe to contra-indicate the use of the method.

L. Grasset<sup>14</sup> treated 59 cases of typhoid fever with a **Serum** prepared by the hyperimmunization of horses with detoxicated toxin. In many uncomplicated cases a single intramuscular injection of 20 c.c. was sufficient, but most cases needed three injections. The effect of the injection was a rapid improvement in the general condition, disintoxication, and disappearance of nervous symptoms. When the treatment was applied early, the disease was aborted in most cases.

M. L. Gawler<sup>15</sup> recommends intravenous injections of **Trypaflavine** every two or three days in severe cases of typhoid fever which show no tendency to react to other treatment, in doses of 0.20 gm. in 1 per cent solution. Its administration should be preceded and followed by dosage of the blood-urea, as the drug is liable to damage the renal cells.

REFERENCES.—<sup>1</sup>*Monthly Epidem. Rep. Health Sect. League of Nat.*, 1931; <sup>2</sup>*Jour. Amer. Med. Assoc.*, 1931, xvi, 1576; <sup>3</sup>*Marseilles méd.*, 1930, 734; <sup>4</sup>*Arch. de Méd. et de Pharm. milit.*, 1930, 659; <sup>5</sup>*Rev. méd. de Barcelone*, 1930, 512; <sup>6</sup>*Jour. Amer. Med. Assoc.*, 1930, xiv, 405; <sup>7</sup>*Jour. Philippine Ist. Med. Assoc.*, 1930, 311; <sup>8</sup>*Thèse de Paris*, 1930, No. 110; <sup>9</sup>*Ibid.*, No. 307; <sup>10</sup>*Lancet*, 1931, i, 1294; <sup>11</sup>*Thèse de Paris*, 1931, No. 407; <sup>12</sup>*Bull. Soc. méd. Hôp. de Paris*, 1931, 718; <sup>13</sup>*Thèse de Montpellier*, 1929-30, No. 3; <sup>14</sup>*Jour. Med. Assoc. S. Africa*, 1930, 380; <sup>15</sup>*Thèse de Paris*, 1931, No. 63.

## TYPHUS FEVER.

J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—C. M. Smith<sup>1</sup> reports two cases of typhus which occurred at Glasgow in May, 1930, and were the first examples of the disease in that city since the outbreak recorded by Davidson and Cruickshank in 1926 (see MEDICAL ANNUAL, 1928, p. 505). The infection may possibly have been brought over from Ireland, where twenty-five cases had been reported between March and June, 1930.

F. Keane<sup>2</sup> states that in the West of Ireland typhus tends to appear in the late spring and early summer, when the potatoes are getting bad and India meal forms an important article of diet. As some India meal comes from South Russia, where typhus is prevalent, and the meal has been found to contain lice, meal may be the cause of the outbreak. Another possible cause is cast-off or second-hand clothing which is brought to the West of Ireland in large quantities from Glasgow and Liverpool, where typhus is endemic.

P. Peverelli<sup>3</sup>, in Java, from examination of the Weil-Felix reaction in 2250 sera, some of which came from febrile patients and others had been sent for the Wassermann reaction, found that 29 or 1.28 per cent gave a positive reaction of 1-200 or higher. He therefore agrees with Wolff (see MEDICAL

ANNUAL, 1931, p. 494) that tropical typhus exists in the East Indies and should always be considered in dealing with obscure cases of fever. The Weil-Felix reaction, however, must be interpreted with caution and should be repeated at different times and with different strains.

A. Rumreich, R. E. Dyer and L. F. Badger<sup>4</sup> record their observations on 100 cases, which they divide into two epidemiologic groups. The first group was essentially urban and consisted of cases of endemic typhus, while the second group, composed of cases of known or presumed rural origin, which frequently followed tick-bite, was clinically Rocky Mountain spotted fever. There were no deaths in the endemic typhus group, but seven deaths occurred in the Rocky Mountain spotted fever group. The first group attained its maximum prevalence in summer and autumn, and the second was most prevalent in June and July. There was a preponderance of males in both diseases. The bulk of the endemic typhus cases occurred in middle-aged persons, but Rocky Mountain spotted fever attacked a large number of children. Most of the cases in the first group were sporadic, whereas in the second they were mostly grouped in areas of five to twenty miles in diameter. Seventy-eight per cent of the endemic typhus cases had occurred in close association with rats, while in Rocky Mountain spotted fever a definite history of tick-bite within three weeks prior to onset was obtained in 48 per cent.

W. Barykine, S. Minervine and A. Kompančez<sup>5</sup> found on examination of 72 healthy members of a Moscow family in which typhus had occurred that in 16 the serum had agglutinated *B. proteus* in dilutions ranging from 1-160 to 1-400. Inoculation of a guinea-pig produced a typical febrile reaction, and microscopical examination post mortem showed characteristic lesions in the capillaries of the brain, heart, liver, kidneys, suprarenals, and testicles. The condition of the sixteen patients corresponded to that described in guinea-pigs under the name of 'non-apparent typhus' in 1919 by Nicolle and Lebailly, who expressed the opinion that it might also occur in the human subject during epidemics of typhus. The only other examples of non-apparent typhus in man were described by Ramsine in Serbia in 1928.

ETIOLOGY.—M. Nagayo, T. Tamiya, T. Mitamura and H. Hazato<sup>6</sup> injected the blood of a guinea-pig infected with typhus into the anterior chamber of the eye of another guinea-pig or rabbit and produced a serious iritis closely resembling that found by similar inoculation in the tsutsugumashi disease, though with a shorter incubation period. The guinea-pig's eye when once infected proved absolutely refractory to a second injection. An examination of the inflamed iris showed in Descemet's membrane a certain number of corpuscles which appeared to correspond exactly to the *Rickettsia prowazeki* found in infected lice and regarded as the virus of typhus.

SYMPTOMS.—C. J. Wu and H. A. Reimann<sup>7</sup> performed the intracutaneous tuberculin test in 20 Chinese typhus patients aged from 20 to 30 without any active clinical tuberculosis. Only 4 gave a positive reaction during the febrile period, but when the test was repeated in convalescence 12 were positive and the 4 previously positive patients gave a slightly more intense reaction than on the previous occasion. The tuberculin reaction, therefore, in typhus is similar to that in measles, influenza, and other acute infectious diseases.

REFERENCES.—<sup>1</sup>*Glasgow Med. Jour.* 1930, cxiv, 117; <sup>2</sup>*Irish Jour. Med. Sci.* 1930, 515; <sup>3</sup>*Meded. v. d. Dienst. d. Volksgez. in Nederl.-Ind.* 1930, 184; <sup>4</sup>*Public Health Reps.* 1931, 463; <sup>5</sup>*Arch. Inst. Pasteur de Tunis*, 1930, 422; <sup>6</sup>*Comptes rend. Soc. de Biol.* 1930, civ, 641; <sup>7</sup>*Nat. Med. Jour. China*, 1931, 210.

**ULCERATIVE COLITIS.** (See COLITIS, ULCERATIVE.)

**ULCERS, VARICOSE.** (See VARICOSE ULCERS.)

**URÆMIA.** (See RENAL DISEASE.)**URETER, SURGERY OF.**

Sir John Thomson-Walker, F.R.C.S.

C. P. Math<sup>1</sup> reports 6 cases of apparently *hopeless and incurable bladder disease* in which symptoms were greatly relieved by diversion of the urine by means of **Transplantation of the Ureters** into the skin of the iliac fossæ. He considers that this should be the operation of choice in such cases when the patients are cachectic and debilitated, because it is a simple, rapid operation devoid of shock.

H. S. Jeck<sup>2</sup> considers that whenever nephrectomy for a non-tuberculous infection of the kidney is contemplated, careful pre-operative investigation of the ureter as well as the kidney itself should be carried out. If *ureteral conditions such as stone, stricture in the presence of pus, or a dilated atonic type of ureter* are met with, the question of performing **Ureterectomy** at the time of the nephrectomy should be given very serious consideration. If the patient's general condition will permit of it, ureterectomy performed at the time of nephrectomy should, as a rule, be a simpler procedure than when carried out at a later period as a separate operation, because adhesions arising from peri-ureteritis are apt to be both dense and numerous.

*Pyo-ureter* is the result of two main factors, obstruction, and injury to the nerve supply of the ureter leading to loss of peristalsis and lack of tone. The chief etiological factor in most cases of pyo-ureter is the presence of ureteral calculus. While the occurrence of pyo-ureter, even in association with stone formation, is relatively rare, when present it is a dangerous condition, and more attention, therefore, should be directed towards its prevention, and the treatment of choice after its occurrence is complete **Ureterectomy**.

V. A. Nardiello<sup>3</sup> discusses the non-operative methods of extraction of *ureteric calculi* under four groups: (1) Catheter manipulation and ureteral dilatation with or without the use of forceps; (2) Fulguration; (3) The injection of sterile oil or glycerin; (4) Incision of the ureteral orifice. He reports seven illustrative cases in detail, and emphasizes the advantage of attempting every possible means of non-operative removal of the stone before resorting to surgical intervention. He states that an important consideration is the avoidance of risk of stricture of the ureter which is so often the sequel to the formation of scar tissue in operative wounds. [The most important consideration is that by these methods of manipulation it is possible in at least 80 per cent of cases of recently impacted ureteric calculi to avoid an important cutting operation with its attendant risks. I have never seen a stricture form in a ureter as the result of a longitudinal incision for calculus.—J. T.-W.]

The size, structure, and situation of the ureter render it the least vulnerable portion of the urinary system, but *extravasation of urine* from it may result from bullet or stab-wounds, from damage in the course of operations upon adjacent structures, and from over-zealous manipulations with ureteral bougies, dilators, and metal stone extractors. Much more unusual is the extravasation which occurs in the absence of such external forces, and J. F. Geisinger<sup>4</sup> reports three cases in which the causative factor was necrosis as the result of impaction of a calculus within the ureter. The clinical picture depends upon the amount of the extravasation, the virulence of any associated infection, and the reaction of the patient. Thus, rapidly spreading infection may result, or the process may become localized with or without abscess formation. The diagnosis in such cases is difficult, and, as an aid, the writer is in favour of early instrumental urography. The diagnosis in two of the three cases he reports was established by urography, and in the remaining case the condition was disclosed at post-mortem examination.

G. L. Hunner and B. D. Massey<sup>5</sup> report four cases of bilateral *anastomosis of the ureter into the bowel* by Coffey's method of submucous implantation. Details of the operative technique are given, together with the course of the after-treatment. The first patient is in apparently good health eleven years after the operation, although the writers consider that there is probably some stricture formation at the site of the anastomosis with associated bilateral chronic pyelitis. They ascribe the stricture formation to the use of permanent retention sutures. The second patient died three months after operation from recurrence of a carcinoma of the cervix. This patient had acute bilateral pyelitis immediately after operation which subsided during the course of convalescence. The third patient was alive five years after operation in apparently perfect health. The fourth patient, in whom the indwelling catheter method was employed, had an uneventful convalescence. In her case the operation was performed for a severe vesico-vaginal fistula following injury at childbirth. There was no impairment of the renal function as the result of operation, and the patient was discharged from hospital twenty-five days after operation.

REFERENCES.—<sup>1</sup>*Calif. and Western Med.* 1931, Feb., 97; <sup>2</sup>*Surg. Gynecol. and Obst.* 1931, June, 1158; <sup>3</sup>*Amer. Jour. Surg.* 1931, Jan., 72; <sup>4</sup>*Ann. of Surg.* 1931, Feb., 544; <sup>5</sup>*Amer. Jour. Surg.* 1930, Nov., 245.

## URETHRA, DISEASES OF.

*Sir John Thomson-Walker, F.R.C.S.*

**Recto-urethral Fistula.**—E. Chauvin<sup>1</sup> discusses the treatment of this condition and describes the various surgical procedures for its treatment. He concludes with a detailed account of his own method. After performing suprapubic cystotomy and dilatation of the urethra, a curved incision, concave behind, is made between the two ischial spines, and the urethra is separated from the rectum—a separation necessarily difficult in an indurated and deformed region. This separation must pass well beyond the fistulous track, at least as far as the prostate. In the lateral angles of the wound the free margins of the levatores ani muscles must be recognized and freed carefully. The urethral orifice of the fistula is now closed by non-penetrating, interrupted catgut sutures, if possible in more than one layer. In the same way the rectal orifice is then closed. The free margins of the levatores ani muscles are then sewn together in the median line, over as great an extent as possible, by a series of interrupted catgut sutures. Anteriorly, these muscles are then fixed to the bulb of the urethra, superficially to the closed fistulous orifice, with a few interrupted catgut sutures. Posteriorly, the muscles are fixed in the same way to the anterior wall of the rectum, except that in this situation they are attached in such a way that the repaired fistulous orifice lies superficial to the muscles.

REFERENCE.—<sup>1</sup>*Presse méd.* 1930, Dec. 24, 1763.

## URETHRA, OBSTRUCTION OF.

*John Fraser, Ch.M., F.R.C.S.Ed.*

Meredith Campbell<sup>1</sup> contributes a study of the posterior urethral obstruction of childhood. Folds or urethral valves were first described by Langenbeck, but it was only as a result of Young's work that their significance was fully recognized. These valves may take the form of mucosal ridges, folds, cusps, or diaphragms, and are usually attached to the verumontanum or to the urethral wall in its immediate neighbourhood (*Fig.* 117). Their etiology, beyond the fact that they are congenital, is imperfectly understood, but they lead eventually to hypertrophy and later dilatation of the bladder, and to hydro-ureter and hydronephrosis. The main importance of urethral valves is in relation to the diagnosis and treatment. The symptoms which suggest the



presence of valves in childhood are those of infra-vesical obstruction and of renal failure, and the diagnosis is easily confirmed by urethroscopy.

**TREATMENT.**—This involves two distinct procedures: (1) The treatment of the bladder retention; (2) The removal of the obstruction. When there is much residual urine and signs of renal failure, continuous drainage of the bladder should be carried out, either by an indwelling urethral catheter or by suprapubic cystotomy. The drainage is continued until the renal stability has been re-established. Campbell recommends the excision of the obstructing valve leaflets by means of an electric cutting current under direct vision; this gives satisfactory results, and is attended with little or no bleeding. While the occurrence of posterior urethral valves is now a distinct clinical entity, the explanation which the late Dr. John Thomson put forward to account for congenital dilatation of the bladder should not be lost sight of. He attributed this condition to "a state of inco-ordination between the sphincter and detrusor muscular apparatus of the bladder", and J. Fraser<sup>2</sup> suggests that the ridges or valves are probably the result of the hypertrophy of the circular fibres of the sphincter.



Fig. 117.—Congenital valve of the urethra (Young). (By kind permission of the 'Journal of the Canadian Medical Association'.)

**REFERENCES.**—<sup>1</sup>*Jour. Amer. Med. Assoc.* 1931, Feb. 21, 592; <sup>2</sup>*Trans. Med.-Chir. Soc. Edin.* 1931, 189.

## UROGRAPHY.

Sir John Thomson-Walker, F.R.C.S.

A large number of articles dealing with excretion urography have appeared in the journals of Canada (Berry,<sup>1</sup> Laroche,<sup>2</sup> McClelland<sup>3</sup>), the United States (Beer,<sup>4</sup> Hyman,<sup>5</sup> Jaches,<sup>6</sup> Kretschmer,<sup>7</sup> Randall<sup>8</sup>), France (Boeckel and Franck<sup>9</sup>), Germany (Baensch,<sup>10</sup> Hoffmeister,<sup>11</sup> Lauber,<sup>12</sup> Perlmann,<sup>13</sup> Pflaumer<sup>14</sup>), Austria (Hutter,<sup>15</sup> Palugay<sup>16</sup>), Argentina (Bengolea and Saralegui<sup>17</sup>), and Great Britain (Cooke,<sup>18</sup> Everidge,<sup>19</sup> Galbraith,<sup>20</sup> Jacobs<sup>21</sup> Kidd,<sup>22</sup> Mackay,<sup>23</sup> Roche,<sup>24</sup> Wade and Bond,<sup>25</sup> and Willan.<sup>26</sup>)

The present position of this method of investigation has been excellently summarized by von Lichtenberg,<sup>27</sup> the originator of the method, and extracts from his articles will be given, while perusal of the original article and of those of the other writers named is recommended.

It is of interest in this connection to recall that it was von Lichtenberg, in association with Voelker, who introduced instrumental urography in 1906. In a lecture before the Section of Urology at the Royal Society of Medicine, London, in March, 1931, on the "Principles and New Advances in Excretion Urography," von Lichtenberg stated that the report dealt with the results obtained in more than 2000 clinical cases and concerned the investigation of seven different chemical substances employed intravenously for the purpose, five of these substances being reported for the first time.

These investigations permit the formulation of the scientific principles underlying excretion urography. The writer is emphatic that the older method of instrumental pyelography must be regarded as an essentially different process from the more recent intravenous method. The older method is an anatomical one and can be used only to detect the anatomical changes resulting from disease. The intravenous method, on the other hand, in addition to detecting anatomical changes gives a picture of the disease in its physiological details—that is, it gives an indication of the renal function and of the dynamics of the urinary tract. Furthermore, excretion urography is possible in cases in which, on account of anatomical and other hindrances, instrumental urography is impossible. The writer states that certain authors with little experience in the application of intravenous urography and in the interpretation of the urograms to be derived from it, consider that they have observed the failure of normal kidneys to excrete the contrast substance. He considers that such reports are the result of defective observation.

Normally functioning kidneys, with normal or hypertonic motility of the urinary tract, are those which are the least suitable for roentgenological visualization. A picture can only be obtained when the various portions of the urinary tract are filled with the contrast substance. If the exposure is taken at the moment of diastole, one may expect a picture, as the relaxed portions of the urinary tract may be filled with the contrast substance. If, on the other hand, the exposure is taken in systole, visualization will be lacking; and, further, in those cases in which the emptying of the upper urinary tract is for any reason accelerated or precipitous, repeated exposures may also be ineffectual. It must be accepted as one of the main principles of excretion urography that every contrast substance which is suitable is eliminated by a normally functioning kidney in the measure of its absolute or relative kidney threshold. It may therefore be stated that the elimination of a contrast substance is in itself an index of renal function and can be used as such clinically. Hughes and Peterfi have shown that the uroselectan group of drugs is eliminated principally through the glomeruli, and therefore the method, when such drugs are used, is of great value in detecting the presence of glomerular damage. In tubular damage, the pure form of which is found in cases of obstruction of the urinary tract, a degree of visualization is obtained which over-estimates the actual renal function, because of the retention and concentration of the contrast substance in the urinary tract. But even in this large group of secondary surgical diseases of the kidney valuable information concerning renal function is obtained when interpretation of the visualization is correlated with the anatomical findings. Under these circumstances the test indicates the renal function at a given time only, and is not necessarily a measure of permanent damage, in that the function may improve materially on relief of the obstruction by appropriate means. We have thus always to

consider the individual peculiarities of a given case and the nature of the disease in order to arrive at a correct interpretation of the functional disturbances. The degree of renal function can be judged in many cases by the time of appearance of the pictures and the intensity of the visualization. In unilateral renal disease, primary or secondary, the principles mentioned above will permit of a satisfactory estimation of renal function. In bilateral renal disease, however, such an estimation is more difficult and each case must be judged individually. Visualization is absent in the presence of pronounced renal insufficiency, but in such a case if peripheral obstruction is present one may obtain visualization even in the presence of such renal insufficiency, and in such cases blood-retention studies will help to reveal the true state of the kidneys. In addition to the ordinary blood-retention tests, a test has been devised for estimating the amount of the contrast substance, such as uroselectan, present in the blood and urine. Excretion urography will give all the necessary information in the great majority of cases of unilateral renal disease, in that, in addition to visualizing the renal function, it gives a urogram which makes the anatomical diagnosis possible. In secondary bilateral renal disease all the necessary information can also be obtained by similar means. In primary bilateral renal disease, however, the method as a means of determining renal functional capacity is not of great value, and it is in this group of diseases that a further advance in excretion urography must be awaited.

Von Lichtenberg emphasizes the value of excretion urography as a means of visualizing the dynamic disturbances of the urinary tract, and thus raising new possibilities in diagnosis and treatment, especially in those cases with but slight impairment of renal function and slight anatomical changes in association with marked subjective symptoms which are difficult or even impossible to explain. He is averse from any attempt to increase the visual intensity of the pictures by artificial compression, as this disturbs physiological processes and inhibits the dynamics of the urinary tract. Excretion urography gives a truer visualization of the normal pelvis than instrumental pyelography or pyeloscopy, in that by its means we learn that the pelvis has not a constant size and form, but, owing to peristalsis, is constantly changing, and we can determine whether the filling of the pelvis is greater than the emptying as the result of dynamic disturbances, and this von Lichtenberg considers to be one of the chief purposes of excretion urography. Excretion urography further permits of visualization of the renal parenchyma itself, and is thus of value in showing up anomalies, e.g., horseshoe kidney. The shadow of the parenchyma is always less intense than that of the calices and pelvis, and this is explained by the difference in the distribution and concentration of the contrast substance. At present it is impossible to localize a defect in the renal parenchyma such as might be due to tuberculosis or tumour, probably because the pathological tissue cannot be differentiated in the nephrogram from the surrounding tissue.

Discussing contrast substances, the writer states that the first requisite is tolerability of the substance on intravenous injection, and he describes and compares the five new contrast substances.

Von Lichtenberg concluded his lecture with a remarkable demonstration of a series of 146 radiograms illustrating the distinguishing features of excretion urography as compared with those of instrumental pyelography.

REFERENCES.—<sup>1</sup>*Canad. Med. Assoc. Jour.* 1931, June, 798; <sup>2</sup>*Ibid.* 1930, Sept., 414; <sup>3</sup>*Ibid.* 1931, Feb., 213; <sup>4</sup>*Ann. of Surg.* 1930, Oct., 761; <sup>5</sup>*Surg. Gynecol. and Obst.* 1930, Sept., 409; <sup>6</sup>*Jour. Amer. Med. Assoc.* 1930, Nov. 8, 1409; <sup>7</sup>*Surg. Gynecol. and Obst.* 1930, Sept., 404; <sup>8</sup>*Ann. of Surg.* 1931, June, 1202; <sup>9</sup>*Lyon Chir.* 1931, Jan.-Feb., 5; <sup>10</sup>*Arch. f. klin. Chir.* 1931, Feb., 605; <sup>11</sup>*Deut. Zeits. f. Chir.* 1931, Jan., 152; <sup>12</sup>*Ibid.* May, 154; <sup>13</sup>*Munch. med. Woch.* 1931, June 5, 955; <sup>14</sup>*Deut. Zeits. f. Chir.* 1930, Nov.,

309; <sup>15</sup>*Wien. klin. Woch.* 1930, July 10, 879; <sup>16</sup>*Ibid.* 1930, Aug. 7, 999; <sup>17</sup>*Bol. y Trab. de Soc. de Chir. de Buenos Aires*, 1930, Sept. 3, 562; <sup>18</sup>*Lancet*, 1930, ii, 686; <sup>19</sup>*Proc. Roy. Soc. Med.* 1931, April, 763; <sup>20</sup>*Glasgow Med. Jour.* 1931, Jan., 1, <sup>21</sup>*Ibid.* 1930, Nov., 224; <sup>22</sup>*Lancet*, 1930, ii, 128; <sup>23</sup>*Glasgow Med. Jour.* 1931, Jan., 9; <sup>24</sup>*Practitioner*, 1931, March, 312; <sup>25</sup>*Edin. Med. Jour.* 1930, Dec., 203; <sup>26</sup>*Practitioner*, 1930, Aug., 296; <sup>27</sup>*Brit. Jour. Urol.* 1931, June, No. 2.

## UROLOGICAL EXAMINATION OF CHILDREN. (See CHILDREN.)

### URTICARIA.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

K. E. Harris<sup>1</sup> has investigated cases of spontaneous urticaria by the methods devised by Lewis. He concludes, from the reactions obtained, that the mechanism is the same as for those urticarias which are specific to one type of stimulus (such as cold, light, and heat), i.e., the liberation of H-substances from the skin cells. He finds that all the subjects suffering from spontaneous urticaria gave factitious urticaria on stroking; this phenomenon passed off as the attack of spontaneous urticaria subsided. Transference tests yielded results which suggested that a toxic body was circulating in the blood.

REFERENCE.—<sup>1</sup>*Quart. Jour. Med.* 1931, April, 347.

### UTERUS, DISORDERS OF. (See DYSMENORRHOEA; ENDOMETRIOSIS; HYSTERECTOMY, VAGINAL; METROPATHIA HÆMORRHAGICA.)

### VACCINATION. (See also SMALL-POX.) J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—W. Chodzko<sup>1</sup> states that as the result of the increasingly strict application of the law passed in 1919 for compulsory vaccination, the total number of small-pox cases notified in Poland has fallen from 5078 cases with 823 deaths in 1921 to only 12 cases with 1 death in 1929. The total number of vaccinations performed in Poland during the period 1925-9 has ranged from 1,737,402 to 1,954,332 annually for a population of about thirty millions.

According to G. Stuart and K. S. Krikorian<sup>2</sup> vaccination in Palestine was carried out only half-heartedly during Turkish sway, while inoculation was still occasionally employed with fatal results, as the mortality among 137 cases of inoculated small-pox was 7.3 per cent. Under British administration, however, vaccination within the first three months of life has been made compulsory, and the lymph, which is prepared at the Central Laboratories of the Palestine Government Department of Health, has been kept in cold storage. The result has been that during the last ten years there have been only 60 cases of true small-pox, with a mortality of 26.6 per cent, and 137 cases of inoculated small-pox, with a mortality of 73 per cent, and during the years 1928-30 inclusive there have been none at all.

No cases of post-vaccinal encephalitis have occurred in either Poland or Palestine, and neither country has an antivaccination party.

According to K. Urbanek<sup>3</sup> every citizen of the Czechoslovak Republic has to be vaccinated at the age of 1 year and revaccinated at 7 and 14 years. Compulsory revaccination also applies to all recruits, post-office and railway employees, vagrants, hospital staffs, and, in epidemics of small-pox, all the inhabitants of the affected district. The results of primary vaccination are positive in about 98 per cent, and of revaccination in about 95 per cent.

SYMPTOMS AND COMPLICATIONS.—P. Toulant<sup>4</sup> says that *ocular complications* due to accidental inoculation of vaccinia are uncommon, as he has been able to collect only about 100 cases. The vaccinal pustule is usually situated on the lid or occasionally on the conjunctiva. Doctors and midwives are most commonly affected, and sometimes those employed in laboratories where vaccine

pulp is manipulated. Recently-vaccinated children or their parents are less frequently attacked. The symptoms vary according to the localization of the lesions.

Vaccinal keratitis, which may be primary or secondary to a conjunctival or palpebral lesion, may last from six months to a year and leave opacities and synechiae, or give rise to perforation of the cornea and destruction of the eye.

P. Lereboullet and R. Worms<sup>5</sup> describe a *transient splenomegaly* in infants resulting from vaccination, and point out that though no previous examples have been recorded in the human subject enlargement of the spleen was recently described in 24 out of 36 cases of experimental generalized vaccinia in rabbits recorded by Douglas, Wilson Smith, and Price.

*Post-vaccinal Encephalitis.*—The Rolleston Committee on Vaccination,<sup>6</sup> whose first report appeared three years ago (see MEDICAL ANNUAL, 1929, p. 518), have issued a further report based on the study of 90 cases of post-vaccinal nervous disease; 42 were males and 48 females. The ages ranged from 20 months to 55 years, but two-thirds of the patients were children of school age. Forty-seven recovered completely after an illness of from three days to seven weeks, one adult female had not completely recovered after a lapse of six months. There were 42 deaths, of which 41 occurred within three weeks and 28 within seven days. One died of urinary complications after an illness lasting three months. A familial incidence was noted in 4 cases. Certain geographical groupings were found, notably at Bristol, Stoke, Kingston-on-Thames, Wexham, and West Ham, and simultaneous multiple cases occurred near Norwich, Wandsworth, and at Winterbourne, Berks. These eight groups contained 42 cases, the remaining 48 being scattered through eighteen counties. Eighty-three cases followed primary vaccination, and 3 revaccination, while in 4 it was not possible to determine whether there had been a previous vaccination or not. In 42 out of 67 primary vaccinations four insertions had been used. No clinical features not previously observed were encountered. No particular intensity of local reaction was observed, and no case developed generalized vaccinia.

J. F. M. Scott,<sup>7</sup> who has collected 22 cases of post-vaccinal encephalitis in the first year of life, illustrates the rarity of the complication at this age by the following figures. Out of a total of 569 cases of post-vaccinal encephalitis collected from different parts of Europe, only 41 (7.2 per cent) occurred at this age. Of his 22 cases 12 died, and only 1 of the survivors showed any sequelæ.

J. Zappert<sup>8</sup> describes the following varieties of post-vaccinal encephalitis: (1) A meningeal form, liable to be mistaken for tuberculous meningitis. (2) A somnolent and parietic form. The somnolence does not last so long as that of lethargic encephalitis, and is not accompanied by ocular palsies or myoclonus. On the other hand, pareses of the legs and sometimes of the arms may occur, but completely clear up if the patient survives. (3) A convulsive form in which convulsions predominate. Such cases are rapidly fatal. (4) A trismus form resembling tetanus. (5) A neuritic form characterized by tenderness of the nerves and muscles and a typical peripheral paralysis. (6) A myelitic form in which the symptoms are those of transverse myelitis. (7) A hemiplegic form. Examples of this form are recorded by J. Duken<sup>9</sup> and M. Weichsel.<sup>10</sup> (8) Very mild forms characterized by a rise of temperature and slight but definite meningeal symptoms lasting for a few days and then completely disappearing.

According to Zappert<sup>8</sup> the case-fatality of post-vaccinal encephalitis is 58 per cent in England, 31 per cent in Holland, 34.8 per cent in Germany, 71.4

per cent in a small epidemic in the Tyrol, and only 17·8 per cent in Vienna and Lower Austria during 1929.

REFERENCES.—<sup>1</sup>*Bull. off. internat. d'Hyg. publ.* 1931, 45; <sup>2</sup>*Ann. Trop. Med. and Parasitol.* 1930, 527; <sup>3</sup>*Trav. Inst. d'Hyg. publ. Etat Tchecoslov.* 1930, 36; <sup>4</sup>*Paris méd.* 1930, ii, 190; <sup>5</sup>*Ibid.* 400; <sup>6</sup>*Min. of Health Further Rep. Comm. on Vaccination*, 1930; <sup>7</sup>*Brit. Jour. Child Dis.* 1930, 247; <sup>8</sup>*Wien. med. Woch.* 1930, 1443; <sup>9</sup>*Zeits. f. Kinderheilk.* 1930, 1, 293; <sup>10</sup>*Monats. f. Kinderheilk.* 1931, xlix, 28.

## VAGINAL HYSTERECTOMY. (See HYSTERECTOMY, VAGINAL.)

## VAGINITIS, TRICHOMONAS VAGINALIS.

*Beckwith Whitehouse, M.S., F.R.C.S.*

As long ago as 1836 the occasional presence of a flagellated protozoan in the acid secretion of the vagina was reported and described by M. A. Donn<sup>1</sup> under the name of '*Trico-Monas vaginale*'. In 1855 Koelliker<sup>2</sup> stated that he had found the organism in the vaginal discharge of 50 per cent of pregnant and non-pregnant women, and fifteen years later similar figures were published by D. Haussmann.<sup>3</sup> The last ten years have seen the accumulation of a very considerable literature at the hands of German, Russian, and, more recently, American and British observers, and there is no doubt that the organism, as well as being very widespread both in white and coloured races, is much more common than is generally thought to be the case. Excellent reviews of the literature, with clinical and morphological studies of vaginal trichomoniasis, have recently been published by Brook Bland, L. Goldstein, and D. Wenrich,<sup>4</sup> of Philadelphia, J. P. Greenhill<sup>5</sup> of Chicago, and M. N. Andrews<sup>6</sup> in Britain.

Trichomonads occur in the mouth and intestine of man and lower animals, and at times have been found in the urine. The protozoon which affects the human vagina, however, appears to have special morphologic characters and to be specific. The organism is a fusiform or pear-shaped body with free flagella at the anterior end, an undulating membrane extending backwards to about the middle of the body, and a pointed process termed an 'axostyle' projecting posteriorly. It averages about 15 to 18 microns in length and is actively motile. Not only does it rotate on its long axis, but it moves forwards with a jerky motion, pushing its way and insinuating itself between the cells and cellular debris in its vicinity. When observed on a slide, protoplasmic processes may project from the surface, giving to the protozoon an amœboid appearance.

The organism was first grown by K. M. Lynch<sup>7</sup> in 1915, using beef broth as a culture medium. Various media have since been used with better results. Thus J. M. Andrews<sup>8</sup> advises Löffler's blood serum diluted with citrated saline, to which is added a trace of fresh egg albumen. The organisms may be fixed from the vaginal discharge in Schaudinn's sublimate solution for fifteen minutes and stained with Heidenhain's hæmatoxylin. For a quick clinical diagnosis, however, the material should be examined in the fresh state. A drop of the discharge from the examining gloved finger is placed on a slide, to which is added a drop of normal saline. The preparation is examined under a  $\frac{1}{8}$ -in. objective, and in a positive case the picture is typical. A large number of pus cells are seen, few or no epithelial cells, and in every field innumerable trichomonads. When dead the protozoon becomes round and cannot easily be differentiated from the pus cells. The appearance of the organism in a fresh preparation is shown in Fig. 118, taken from J. F. Kleegman's<sup>9</sup> recent paper.

Clinical interest in the *Trichomonas vaginalis* naturally hinges upon the important question whether it is or is not a harmless parasite. It is still a controversial point whether the organism is saprophytic or pathogenic, or whether it becomes pathogenic under certain circumstances. Many European writers and all American authors are convinced that it is pathogenic, and

attribute certain cases of vaginitis, cervical erosion, and chronic purulent leucorrhœa to its presence and activities. Certain it is that the acid frothy discharge from many of these cases contains hordes of the protozoa, and the clinical symptoms improve with their disappearance, but scientific proof of pathogenicity is still to be demonstrated by further laboratory investigation.

J. F. Kleegman,<sup>9</sup> in a report of 78 cases treated in one year, considers that the symptoms of vaginal trichomoniasis are so characteristic as almost to be diagnostic. The outstanding symptom, according to this observer, is an irritating offensive leucorrhœa, frequently accompanied by pruritus vulvæ so severe as to disturb the patient's sleep. Dyspareunia is common, but urinary symptoms are infrequent. An acute vulvitis is present with a foamy yellow or white discharge between the labia, and a dermatitis of the inner aspects of the thighs may coexist. The vaginal mucosa presents a 'strawberry' appearance and bleeds on contact. Not uncommonly the cervix is the seat of an eccentric erosion, but the cervical canal is not affected.

The clinical picture thus resembles that of gonorrhœa, and the suggestion has been made by Kleegman and others that many cases of trichomonad vaginitis are erroneously diagnosed as such. Although of course a double infection may be present, the possibility of a pure protozoal infection should, therefore, not be overlooked in venereal clinics and elsewhere in cases where gonococci are suspected but cannot be demonstrated in the discharge.

**TREATMENT.**—Treatment is as yet unsatisfactory. It is easy to secure an immediate effect and to destroy the organisms present in the genital tract, but recurrences are common, probably because the original mode of infection from the bowel or elsewhere is not known. A most important therapeutic measure, whatever treatment is subsequently employed, is an initial scrubbing and cleansing of the vaginal mucosa, vulva, and perineum with green soap liniment. The area is then dried, and either **Hexylresorcinol**, full-strength **Pyroligneous Acid**, tampons of **Lassar's Paste**, **Mercurochrome**, or **Silver Nitrate** (2 per cent) applied.

The variety of the agents recommended by different writers is a testimony to the difficulty experienced in eradicating the infection. According to

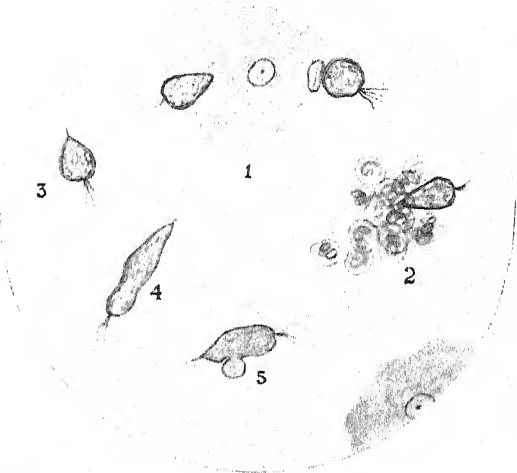


Fig. 118.—*Trichomonas vaginalis*, Donné, as seen in a wet preparation. 1, Two organisms caught by an epithelial cell; 2, Organism in a clump of pus cells; 3, Pear-shaped organism—this is the typical form; 4, Slipper-shaped organism, often seen in an untreated case; 5, Pseudopod formation, which is infrequently seen. The trichomonads are recognized only by their characteristic motion, for when dead they are indistinguishable from the pus cells. (By kind permission of 'Surgery, Gynecology and Obstetrics'.)

Kleegman a patient should not be considered cured until she is organism- and symptom-free for a period of four months after all treatment has been discontinued, not even douching being allowed.

REFERENCES.—<sup>1</sup>*Compt. rend. Acad. de Sci.* 1836, 385; <sup>2</sup>*Beitr. z. Geburts. u. Gyn.* 1855, 131; <sup>3</sup>*Die Parasiten der weiblichen Geschlechtsorgane des Menschen und einiger Tiere*, 1870, 80, A. Hirschwald, Berlin; <sup>4</sup>*Jour. Amer. Med. Assoc.* 1931, Jan. 17, 157; <sup>5</sup>*Ibid.* 1931, May 30, 186; <sup>6</sup>*Jour. Trop. Med.* 1929, Aug., 237; <sup>7</sup>*Amer. Jour. Trop. Dis. and Prev. Med.* 1915, 627, 634; *Jour. Amer. Med. Assoc.* 1922, Sept., 1130; *Amer. Jour. Trop. Med. and Hyg.* 1922, Nov., 531; <sup>8</sup>*Jour. of Parasitol.* 1926, March, 148; <sup>9</sup>*Surg. Gynecol. and Obst.* 1930, Oct., 552.

**VAQUEZ-OSLER DISEASE.** (See ERYTHREMA.)

**VARICELLA.** (See CHICKEN-POX.)

**VARICOCELE.** (See INJECTION TREATMENT OF HYDROCELE, ETC.)

**VARICOSE ULCERS.** (See also VARICOSE VEINS.)

Sir W. I. de C. Wheeler, F.R.C.S.I.

A. Dickson Wright,<sup>1</sup> in a most instructive paper, points out that the femoral artery delivers probably more than a thousand pints of blood to the leg every twenty-four hours. Serious changes occur in the leg if anything interferes with the complicated mechanism whereby this large volume of blood is returned to the heart against gravity. The return of the venous blood depends *inter alia* on the elasticity of the skin, the contraction of the leg muscles, abdominal and thoracic aspiration, contraction of the vein walls, and the elaborate valving of the veins. The last two are the most important. If the mechanism breaks down, the support of shoes or boots prevents œdema and stagnation in the feet (Figs. 119-121). The probable cause in all cases of

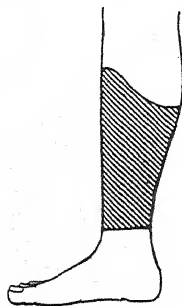


Fig. 119.—The ulcer-bearing area when boots are habitually worn.

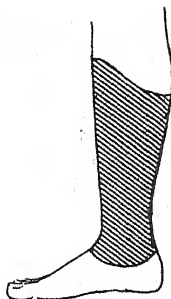


Fig. 120.—The larger area affected when lace-up shoes are used.

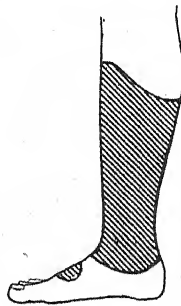


Fig. 121.—Ulcers and eczema also occur in the small area on the dorsum of the foot when shoes with a single strap are worn.

(Figs. 119-122 re-drawn from the 'British Medical Journal'.)

ulceration is gravity, and the best treatment is constant support. The treatment must be such as not to involve hospitalization and it must not be too expensive. It should be simple and within the reach of all medical practitioners.

The treatment recommended by Dickson Wright only requires visits to the hospital at intervals of three weeks. The ulcer is dressed with nothing but its own discharge. The bandage used to support the leg is of elastic sticking plaster which adjusts itself to the gradual shrinkage of the leg. The adhesive



plaster is to a certain extent waterproof, and allows restricted bathing. In large ulcers, skin-grafts are buried in the granulations. The ulcer is not the condition being treated—it is the underlying stagnation of the venous blood, lymph, and tissue fluid. If this is due to varicosity of the veins, these are treated by injection.

It is interesting to note in Dickson Wright's paper that he recommends injection of varicose veins even although there be deep thrombosis following typhoid fever, etc. In cases of damage to the deep circulation he regards superficial varicose veins as an added embarrassment to the sound veins which are transmitting blood in the upward direction. He believes that the only contra-indications to the treatment mentioned are associated arterial disease and diabetes. Briefly, the treatment of varicose ulcers consists in compression, injection, and skin-grafting. Failure is almost invariably due to the looseness of the bandage. Considerable force should be used during its application.

If ulcers do not respond to the treatment, syphilis or malignant disease should be suspected. Eczema develops under the adhesive in about 5 per cent of cases, and in about 1 per cent it may spread to the face and arms. Treatment should be persevered with in spite of distressing eczema, nor should it be stopped owing to the development of blisters.

In about 10 per cent of cases pain is increased at first by the pressure. Rubber pads are valuable aids to increase pressure on the ulcer or in treating ulcers lying in the sulcus under the malleoli where the bandage does not grip very tightly. **Powdered Aspirin** on the floor of the ulcer is an excellent analgesic. Longitudinal strips of the sticking elastic bandage are sometimes used (*Fig. 122*).

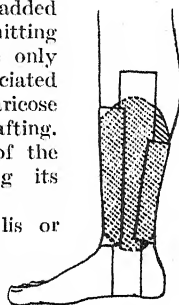
"In these days of humane government, chronic bronchitis in the husband and a varicose ulcer in the wife will maintain a family in certain parishes, and these valuable diseases will not be parted with too easily", but as a rule every patient is anxious to get the ulcer healed. Seventy-five per cent of ulcer cases can be cured, and remain cured without any support but the elasticity of the patient's skin.

REFERENCE.—<sup>1</sup>*Brit. Med. Jour.* 1931, ii, 561.

## VARICOSE VEINS.

Sir W. I. de C. Wheeler, F.R.C.S.I.

**The Technique of Injection Treatment.**—A. R. Rooke<sup>1</sup> uses a tourniquet to distend the veins with the patient in the prone position. He describes his technique as follows: The tourniquet need cause no harmful engorgement; its function is to maintain such a column of blood in the vein when the leg is elevated as is present when the patient is standing. The tourniquet employed is not difficult to use single-handed, and its application is quite painless. It was made by Messrs. Woolley of Manchester, and consists of a rubber bag, rather larger than that used in a sphygmomanometer, and enclosed in a linen washable sheath. A stout webbing strap is slotted into the sheath and fastens with a buckle. A length of rubber tubing and a bulb, fitted with a release valve, provide the means of inflation. The patient stands on the affected limb, the tourniquet is lightly strapped in position, which, if the lower part



*Fig. 122.*—Longitudinal strips put on before the spiral compressing bandage: 1. To prevent the cutting of grooves in the oedematous leg. 2. To prevent the bandage from slipping out of position on the surface of the ulcer which is too moist for the bandage to adhere. This precaution is not necessary when the ulcer is small or the oedema moderate.

of the leg is being treated, is just above the knee. The bag is inflated just sufficiently to maintain the distension present in the erect position, and the patient lies down. His foot is elevated on a cushion or low stool. The needle is then inserted, and if one has a syringe with a slacker fitting plunger it will be unnecessary to withdraw the latter to ascertain when the vein has been entered. Owing to the intravenous pressure blood will flow into the syringe immediately the needle is in the lumen of the vein. The valve of the tourniquet is released, the vein rapidly empties, and the injection is made slowly. There is no need to massage the solution along the vein, as suggested by some writers; gravity carries it upwards. After the injection has been completed a few moments will suffice for the sclerosing solution to have passed beyond the site of injection, when the needle can be withdrawn and the puncture sealed with collodion. The patient remains in the prone position for a minute, when he can be allowed to get up.

The advantages of this method are that from the moment the needle is

inserted until the patient steps off the couch the leg is absolutely immobile; there is no leakage of blood when the needle is withdrawn, and, with reasonable care, no case of complete penetration of the vein need occur.

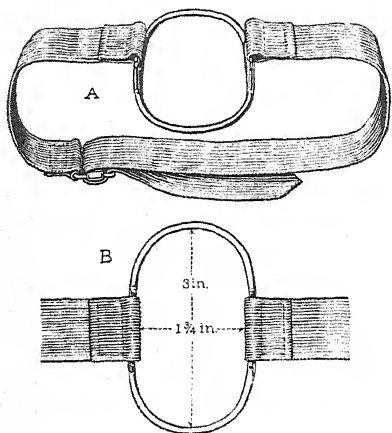


Fig. 123.—Varicose vein occluder. (Figs. 123, 124 by kind permission of 'Annals of Surgery'.)

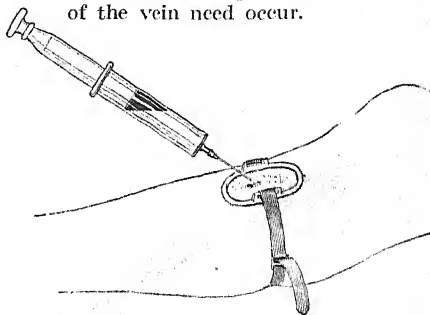


Fig. 124.—Illustrating the technique of injection with sugar solutions.

W. J. Potts<sup>2</sup> discusses the chemical obliteration of varicose veins. He states that in spite of the greatest care and skill the solution will occasionally be injected into the tissues outside the vein, or may leak out of the vein into the subcutaneous tissue after the needle is withdrawn. Such accidents will be harmless if a safe and effective chemical, such as **Glucose**, is used. He recommends 60 per cent glucose. Sugar solutions are not caustic, and for this reason must be kept in contact with the endothelial lining of the vein for a longer period than any of the violent irritants. To accomplish this he recommends the use of a vein occluder (Figs. 123, 124). The occluder is left in position for at least five minutes to hold the glucose in contact with the endothelium. After its removal a gauze pad is fastened over the site of injection with adhesive straps drawn tightly enough to compress the vein. When the varices are large and extend above the knee, the internal saphenous vein should be ligated high up. By preliminary ligation the column of blood is shut off, making subsequent injections more effective. It is not necessary to confine the patient to bed.

R. W. Stuebner,<sup>3</sup> in discussing the injection method of treatment, states

that quinine and urethane must be used in amounts not exceeding 6 c.c., and that quinine idiosyncrasies must be guarded against. Its efficiency is limited because of the small amount which may be safely injected. He prefers **Sodium Salicylate**. It is used in 20, 30, and 40 per cent strengths, in amounts from 5 to 30 c.c. per treatment. Some pain is to be expected, but in most cases this means only a brief discomfort. He inserts the needle with the patient in the standing position, and commences at the lowest point above the ankle. The needle must be very sharp. When the needle is in position the patient is put into the recumbent position and the leg is slightly elevated. During the change of position the syringe is disconnected from the needle. An alcohol sponge is placed firmly over the site of injection and bandaged in place. The patient is allowed to rest for thirty minutes without moving. The maximum thrombosis occurs within forty-eight hours, and then further injections may be made at a higher level. [It appears to the reviewer that it is better to have the patient in the horizontal position with the leg elevated, from start to finish. The veins can be made sufficiently prominent by the use of a tourniquet. Changing from the standing to the lying positions after the needle is inserted may disturb the position of the needle in the vein. In his experience the standard solutions of **Quinine and Urethane** supplied in ampoules are quite satisfactory.—W. I. de C. W.]

**CAUSES OF FAILURE.**—Géza de Takáts<sup>4</sup> deals with the causes of failure in the injection treatment of varicose veins. If the bevel of the needle is too long, the vein can easily be transfixated. If the bore of the needle is too large, leakage may occur after the needle is withdrawn. If the vein is not emptied of blood, too much dilution takes place. Unless the vein is compressed above and below, the solution is carried away too soon. Unless pressure-pads are applied after the injection, the thrombi are large or soft, or do not form at all. If the legs are not bandaged for about three weeks after the completion of the treatment, the recently organized thrombi may canalize and an early recurrence may take place.

**Mistakes in the Selection of the Proper Solution.**—The author states that one still hears of the use of mercury compounds in enormous doses. Two patients died of acute mercury poisoning following injection treatment. The salicylates are poorly tolerated by many patients and so is quinine. These drugs may cause an anaphylactic shock. He admits, however, that quinine-urethane is most successful, and that all other drugs for injection treatment cause cramping. He believes that the best solution is a mixture of 50 per cent **Dextrose** and 30 per cent **Sodium Chloride** solution in equal parts; 5 to 10 c.c. are used at one injection. Solutions which show precipitates or which turn brownish-yellow should be discarded. The only time when embolism is to be feared is when the patient afflicted with varicose veins has to stay in bed for a prolonged time. About 10 per cent of de Takáts' cases showed recurrence. A large group of recurrences are due to the fact that the venous reflux from above has not been entirely stopped. For this group he advocates the ambulatory ligation of the saphenous vein. Even if this has not been done at the time of first treatment, it may be done after the cause of recurrence has been ascertained.

REFERENCES.—<sup>1</sup>*Brit. Med. Jour.* 1930, ii, 120; <sup>2</sup>*Ann. of Surg.* 1930, Sept., 475  
<sup>3</sup>*Surg. Gynecol. and Obst.*, 1930, Aug., 169; <sup>4</sup>*Jour. Amer. Med. Assoc.*, 1931, April 4, 1111.

**VARIOLA.** (See SMALL-POX.)

**VEINS, VARICOSE.** (See VARICOSE VEINS.)

**VETERINARY SURGERY IN RELATION TO PUBLIC HEALTH.**

*Frederick Hobday, C.M.G., F.R.C.V.S., F.R.S.E.*

The medical profession as a body has no conception of the part played by the members of the veterinary branch of medicine in the preservation of public health; nor does it appear to fully realize that the absolute freedom of man, as well as animals, in Great Britain, from such diseases as glanders and rabies (to mention only two of the most terrible of the diseases which are infectious from animal to man) is due to the efficient administration and control exercised by the Veterinary Department of the Ministry of Agriculture and Fisheries, and the collaboration of the members of the veterinary profession. Other diseases, such as anthrax and foot-and-mouth disease, although occurring at spasmodic intervals, would be a menace to man if they were allowed to spread without control amongst the animals of this country. Tuberculosis, which is such a scourge among human beings, is equally prevalent among dairy cows; whilst minor diseases, such as mange of the dog or horse, and ringworm of the cat or calf, are readily contagious to human beings; and would give rise, if unchecked, to a great deal of discomfort, apart from any question of economic loss.

The above-mentioned are only a few diseases for the prevention of which it is necessary in the interests of the public health that the medical man should seek the aid of his veterinary *confrère*; and it is worth our while to consider some of these ailments for a few moments in detail.

**Glanders.**—This is primarily a disease of the horse tribe, and affects either horses, asses, or mules. Its cause—the *Bacillus mallei*—is an extremely dangerous organism to work with in the laboratory. The disease is one which is most commonly met with amongst stable workers and those who come in contact with horses; and some twenty years ago grooms and stablemen of studs in our big cities all knew its name. A man can be readily infected by the discharge from the nostrils of an infected horse or even by handling the brushes, sponges, or stable-cloths which have been in contact with a glandered horse. In the South African War it accounted for the deaths of many thousands of our army horses; and indeed in all wars it has been the bugbear for which the Army Veterinary Officer must always be on the look-out.

Horses suffering from this complaint are unable to do their work properly; and it is so insidious that, until it has been present in the system for a certain length of time, its presence may remain unsuspected. Modern veterinary science has now, however, at its command a method by which its detection can be made certain, for by the introduction of a few drops of **Mallein** (a special preparation made from the *Bacillus mallei* itself) the skilled veterinarian can make a diagnosis with certainty within forty-eight hours, even if the animal is infected only in the slightest degree. During the Great European War, by means of this test applied by the officers of the Royal Army Veterinary Corps, glanders was entirely eradicated from the horses and mules of the British Army, and it has been applied so successfully in Great Britain that at the present time the disease has absolutely ceased to exist. This means that now it has been eliminated from the list of ailments which the veterinary surgeon is called upon to diagnose, it has also been eliminated from the list of the diseases which his medical *confrère* is called upon to diagnose in man. As long as the present regulations of the Veterinary Department of the Ministry of Agriculture and Fisheries are kept in operation, so long will man and animals in this country be unassailed by glanders.

**Rabies.**—This disease has not been met with in man in England for more than thirty years; and it can never appear again as an epidemic in this country so long as control is kept upon the importation of animals of the dog

and cat tribe. The primary cause of rabies in man is the contact of an abraded surface of the body with the saliva of a rabid animal; and whether the infected animal is a horse, a sheep, or any other animal, the infection has always had its primary origin from a rabid dog or cat. The Muzzling Order, which was imposed a number of years ago, succeeded in eradicating the disease from Great Britain, and it then remained for the Veterinary Advisors of the Ministry of Agriculture and Fisheries to take steps to see that it was not reintroduced into the country. This explains the present quarantine regulations imposed upon all dogs and cats admitted from countries where rabies exists. The decline in the incidence of the disease is further proof of the value of the collaboration between the forces of the veterinarian and the medical man in the cause of public health.

**Anthrax.**—This condition is particularly met with in cattle, horses, sheep, and pigs. The dog, cat, and fowl possess a comparatively high power of resistance to infection. It is a disease which is always serious, and invariably results in death. In cattle especially, death is very sudden, and the Government has imposed laws and regulations which provide that the body must be cremated as near as possible to the place where the animal died. It is forbidden, too, in any way to cut the carcass, for on many occasions those making, or assisting at, the post-mortem have become infected, and have died in consequence. In Liverpool, Bradford, and other districts where wool from foreign countries is handled, disinfection is compulsorily adopted with satisfactory results; and if such a practice could also be adopted in the case of hides, bone-manure, and other animal products, before they are imported into this country, deaths from anthrax in man and animal would diminish considerably. Cotton, linseed, and other cattle-food cakes come in the same category. Once eradicate anthrax from the animal and animal products, and eradication from man would automatically follow. Anthrax is primarily a disease for the veterinary surgeon to deal with.

**Foot-and-Mouth Disease.**—This disease—so much to the fore at the present time—has in the daily press provoked a good deal of adverse and unwarranted criticism against the Veterinary Advisors to the Ministry of Agriculture and Fisheries; but there is no question but that they have adhered to the correct policy (that of 'stamping out'). We have much to congratulate ourselves upon when we compare our position with that of other European countries. The cost to Holland, France, Belgium, Denmark, and Germany, amounts to tremendous sums each year, and they never get any further forward, having the disease always endemic. The statistical table below,

OUTBREAKS OF FOOT-AND-MOUTH DISEASE DURING 1930.

MONTH	GREAT BRITAIN	FRANCE	GERMANY	HOLLAND	BELGIUM
January .. ..	—	849	1,235	13	16
February .. ..	—	898	1,356	9	21
March .. ..	—	477	1,814	5	19
April .. ..	—	365	2,024	136	45
May .. ..	—	307	2,541	1,569	109
June .. ..	—	283	3,097	6,117	117
July .. ..	—	292	3,555	6,062	147
August .. ..	—	319	3,627	4,262	167
September .. ..	7	651	4,966	4,973	151
October .. ..	—	852	5,602	3,847	73
November .. ..	1	722	5,012	2,234	86
December .. ..	—	530	3,827	1,074	93

showing the respective numbers of outbreaks in other European countries during last year, is convincing evidence.

The public has only to think what it would mean to England if the disease were allowed to spread, with the fact before it that milk from cattle affected with foot-and-mouth disease must not on any account be consumed by children or invalids, nor be given to goats, pigs, or any other animal. (*See also article FOOT-AND-MOUTH DISEASE.*)

**Tuberculosis.**—This is pre-eminently a disease which illustrates the value of collaboration between the medical man and the veterinarian in the cause of public health. No variety of the domesticated animal is immune to tuberculosis, although some are more susceptible than others. The goat, the sheep, and the horse are probably the least affected, but even in these it is only a question of degree, and there is no actual immunity when they are placed under conditions favourable for infection. Birds, especially poultry, are frequently affected, and whenever it appears amongst them the whole flock may have to be destroyed before the disease is eradicated.

It is a disease which the practising veterinarian meets with most commonly in cattle, and there are about a million tuberculous cattle in Great Britain at the present time. These are not all dairy cattle, but it is in these that the danger lies for man, as it is well known that at least 40 per cent of them are affected.

It has been estimated by the late Medical Officer of Health for the City of London that out of fifty consecutive samples of milk which had been purchased within the City boundary not less than 1 in 4 proved to be tuberculous; and Dr. Biggs, the Statistical Assessor in Ireland, has estimated that 6 per cent of the deaths from tuberculosis were due to drinking tuberculous milk. At one of the National Milk Conferences Dr. Stanley Griffiths, in a paper on "Bovine Tuberculosis and its Relation to Man", gave some statistics which went to prove more than ever the necessity for the medical and veterinary branches of medicine to pull together. In an investigation of 1200 cases of tuberculosis he found that 87.5 per cent of infections with tuberculosis of the neck glands in children up to 5 years of age were bovine; and similarly 61.3 per cent of those between 5 and 10 years; 37.9 per cent of those between 10 and 16 years; and 25 per cent of those of 16 years and over. Of 476 cases of bone and joint tuberculosis, 28.7 per cent of those under 5 years were of bovine origin; 23.1 per cent of those between 5 and 10 years; 9.5 per cent of those between 10 and 16 years; and 6.4 per cent of those of 16 years and over. Of 126 cases of lupus, 69 per cent of those under 5 years; 42.5 per cent of those between 5 and 10 years; 60 per cent of those between 10 and 16 years; and 17.6 per cent of those of 16 years and over, were of bovine origin. Similar percentages were found in connection with other diseases; and of 113 post-mortem examinations conducted by the Local Government Board, it was found that in 21.3 per cent of those under 5 years at death the infectious organism was bovine; and similarly in 13.4 per cent of deaths between 5 and 12 years. The same medical scientist estimates that tuberculosis contracted through the consumption of cows' milk causes approximately 3000 deaths every year; and, as all these infections are made in the drinking of milk from cows suffering from tuberculosis of the milk glands, it is hoped that now the new regulations are in operation, which compel the owner of a cow presenting any symptoms suspicious of tuberculosis to call in a veterinary surgeon, they will have the effect of eliminating in a great measure the chances of infection from the cow to man.

That this state of affairs exists in such an enlightened country as Great Britain in 1931 does not speak well for its dairy cattle hygiene, and it makes

one wonder how any milk-drinking infants can escape infection. However, only about 1 per cent of dairy cattle is affected in the udder, and until the infection has reached this organ the milk need not necessarily contain tubercle bacilli. At the same time an infected cow is always a possible source of danger, for one can never tell exactly when the udder tissues will become infected and the milk a source of definite and terrible danger to the children to whom it is offered.

Recent statistics compiled this year by the People's League of Health show that "a proportion of the raw market milk, varying in different parts of the country from 2 to 13 per cent, and having an average of 6·7 per cent, contains living tubercle bacilli."

Pasteurization undoubtedly offers some safeguard, but it is generally admitted that certain valuable properties which raw milk possesses are lost during this process; and there can be no doubt that the best solution of the prevention of infection lies in the endeavour to obtain an absence of the tubercle germs at the source of supply—i.e., the dairy herd. That this can be accomplished, if pecuniary and other necessary adjuncts are available, has been proved by actual experiments, and America has been especially 'go-ahead' in her endeavours to form 'accredited' herds. In that country whole districts have been cleared, and the most stringent laws are enforced in order to prevent reinfection by the entrance of tuberculous beasts into these areas.

In Great Britain progress in this direction has been slow, as the British Public, although not unmindful of the advantages of tubercle-free milk, is not willing as a body to pay an extra price for this guarantee. Dairymen who have gone to the expense and trouble of clearing their herds have not received the encouragement they deserve either from the General Public or from the hospitals and medical practitioners. The latter in particular might do a very great deal more than they are doing to assist in educating the housewives and mothers of young children as to the dangers of tuberculous milk, by urging upon them the necessity for demanding a clean milk supply—one from tuberculin tested cows. (*See also TUBERCULOSIS, BOVINE, IN MAN.*)

**Mange.**—Mange of the horse is now dealt with in all parts of Great Britain, and is compulsorily notifiable under a Mange Order issued from the Ministry of Agriculture and Fisheries. Its spread has now been effectually checked, although the disease is not yet completely eradicated; but the number of cases in the horse is now extraordinarily small. It is, however, to the domestic pets, especially the dog and the cat, that the attention of the Public should be drawn, for it is quite an easy matter for a pet dog to transmit the parasite of mange from itself to its owner. An itchy dog should, therefore, always be regarded with suspicion, and the pernicious habit of allowing a dog to sleep in bed with a human being should be very emphatically discouraged. A dog with mange, especially in hot weather or when its body becomes heated by lying in front of the fire (or sleeping on an eiderdown or blanket), will be continually scratching, especially in the region of the armpits and under the thighs, where the body is hot and the hair is thin. If no treatment is adopted, the dog will break out in sores and the hair will fall off; and the animal will presently smell very offensive and become covered with scabs. If allowed to come into contact with any part of the human body for more than a few minutes, it is quite an easy matter for the parasite to transfer itself to its human host; and it may remain there for a considerable number of days, or even weeks, until it has finished its life-history. During this time it will give rise to a great deal of irritation and discomfort, which could easily have been prevented had the owner of the dog sought veterinary advice.

There are numbers of other diseases in which it is of value to the Public

Health Service that in the fight for their eradication the human physician and the veterinarian should collaborate, for the patients of each are equally attacked. Cancer may be taken as a type, for this dreaded disease is recognized in such veterinary patients as horses, cattle, dogs, cats, and even in fish; and many of the theories which research workers form, if their observations are concentrated on man alone, may at once be seen to be erroneous upon comparing notes with veterinary pathologists whose lives bring them in contact with the comparative aspect. Foreign countries have for a long time recognized this, and their Governments have granted liberal funds for research into the problems of animal diseases and their relation to public health, finding it a paying proposition even if considered only from the economic standpoint. Great Britain has been behindhand in this respect, although during the past few years, by the establishment of an Animal Research Institute connected with the Royal Veterinary College at Camden Town and the Institute of Animal Pathology at Cambridge, also by the establishment of University Veterinary Degrees and a Post-graduate Diploma of Veterinary State Medicine, there is good prospect that well before another decade has passed a Government organization of Veterinary Officers of Health will have as important a place in Public Health as is accorded to the graduates of the human branch of State Medicine.

*See also* SCABIES.

### VISUAL TESTS FOR MOTOR DRIVING.

*W. S. Duke-Elder, M.D., F.R.C.S.*

The visual tests imposed by the Ministry of Transport for the purposes of obtaining a licence for driving a motor-car have given rise to a considerable amount of discussion, and the general practitioner may be called upon to advise whether a candidate for a driving licence may conscientiously apply for one or not. The regulations demand that the testee be able to read an average car number-plate at twenty-five yards. Measurements of the size of the numbers on an average plate show that they are approximately  $3\frac{1}{2}$  in. high by  $2\frac{1}{4}$  in. wide. In the scientific measurement of visual acuity, as, for example, by Snellen test-types, the letters employed are squares, so that an error on the side of safety will be made if the test is taken to be the discrimination of square letters  $2\frac{1}{2} \times 2\frac{1}{2}$  in. at a distance of twenty-five yards or twenty-three metres. This slight reduction in size is more than compensated in practice by the lack of definition and contrast and of adequate illumination in the ordinary reading of the number-plate of a motor-car as compared with the card test-types in the consulting-room. On this basis the test demanded by the Ministry of Transport is equivalent to visual acuity of 6/12, and any patient who can satisfactorily read 6/12 with both eyes open can conscientiously apply for a licence.

It will be readily understood that so far as an adequate test for driving a car is concerned, this criterion gives a very small margin of safety; it must, however, be admitted that it is better than no test at all, and to deal with the matter adequately would introduce many difficulties. For example, the visual field is of as great importance as the visual acuity, and a person with a small central field of one or two degrees, such as occurs frequently in retinitis pigmentosa, and who thus is deprived of all lateral vision and goes about the world looking as if were through a narrow tube, is a much more potentially dangerous driver than another with much less visual acuity but with a wide field. Such a person, for example, if he is looking straight ahead, has no means of seeing the side of the road or vehicles approaching from side roads, nor can he appreciate traffic signals or the directions of those controlling traffic if they



are situated perhaps ten degrees out of his visual axis. Night-blindness is another condition which should certainly preclude driving in the dark, although it is probable that those who suffer from this condition automatically refrain from driving in the dusk. Diseased conditions of the cornea and conjunctiva which produce, or are likely to produce, profuse laceration are also a potential danger. Furthermore, the lack of one eye with the consequent absence of stereoscopic vision should be borne in mind, especially in the case of a person who has recently been deprived of an eye and whose spatial judgements are disorientated: in such a person, until the ground-work for the formation of new types of judgements has been laid down based on the vision of a single eye, the ability to judge distances correctly is very poor. A further consideration of great importance is the question of colour vision.

**Tests for Colour-blindness.**—The tendency to control traffic more and more by coloured lights is again bringing into prominence the value of the various tests of colour vision. No such tests have been embodied in the recent traffic acts, but in view of the importance of the question it may be advisable to give a short summary of the position as it stands to-day.

The prevalence of congenital colour-blindness is perhaps not sufficiently realized, and unfortunately the most common type is that which confuses red and green, two of the colours which are almost universally used to regulate all kinds of transport. Among primitive peoples colour-blindness appears to be relatively common, and it is said in most standard text-books that in civilized communities it occurs in 4 per cent of males and 0.5 per cent of females. More recent statistics by Waller and Planta make the proportion among males considerably higher than this—about 8 per cent. It will be remembered also that the most usual type of red-green blindness is transmitted hereditarily as a typical male-sex-linked character, recessive in the female. As a general rule, therefore, when married to a normal man an apparently normal mother who is a carrier transmits the defect to half her sons, while a defective mother transmits the defect to all her sons, and half her daughters will be carriers. If, on the other hand, a colour-blind father marries a woman who is a carrier, the progeny will normally include 50 per cent colour-blind daughters and 50 per cent apparently normal but transmitting daughters, while 50 per cent of the sons will show the defect. While colour-blindness is, therefore, much more common among males, it is evident in a woman if her mother is a carrier and her father is defective, or if both parents are defective.

To devise a satisfactory and precise test for colour-blindness is a problem of extreme difficulty, for it is impossible for any one person to form an accurate conception of the sensations of another. Moreover, the person himself who is colour defective learns to differentiate objects by their shape and size and general relationships, as well as by their brightness, and since he has gradually learnt from experience the colour names applied to all common objects without having himself any conception of the differences in sensation aroused by them in the average individual, he may pass through life genuinely in ignorance of the difference between himself and others. With this knowledge, and knowing only his own experiences, the colour defective tends to attribute any small differences in interpretation between himself and others to the stupidity of the latter, and it may be only by chance that attention is focused upon his condition by some glaring mistake. It is only by eliminating all the accessory aids of experience by carefully controlled conditions that any adequate opinion can be given as to the completeness of the colour sense. The colour-blind, indeed, experience comparatively little inconvenience in ordinary life, and the whole subject would be of somewhat academic interest were it not frequently necessary to respond to coloured traffic signals promptly and with certainty

while a failure to do so may lead to disastrous consequences, not only to the safety of the individual himself but to that of others.

It would have simplified matters if the usual traffic signals depended less upon their actual colour and more upon their shape: for example, instead of having three identical circular lights, red, green and yellow, it would have assisted colour-deficient individuals very considerably to have one of them, for example, the red danger signal, in the form of a horizontal bar, the caution signal in the form of a circle, and the green 'all-clear' signal in the form of a vertical bar of light. Such a plan would follow the already established semaphore code of signalling, and by its adoption the colour-blind could have relied, as they usually do in the ordinary conditions of life, on other characteristics than that of the colour itself in forming their judgement, instead of being compelled to depend entirely upon luminosity as they are in existing circumstances, for the relative position of the lights may be impossible to determine when one alone is shining in the dark.

It must be admitted that notwithstanding its importance and urgency, the problem of testing the colour sense has not yet been satisfactorily concluded. No system of testing, at the same time rapid, simple, and adequate, has yet been devised; a multitude of tests exist, but even the statutory tests and regulations remain in the unsatisfactory state of varying from company to company, and from country to country. The only method which is entirely reliable depends on spectroscopic investigations of great complexity which require expensive apparatus and a very high degree of specialized skill on the part of the examiner and a considerable amount of intelligence on the part of the testee. It is obvious that these are quite inapplicable for general use. Apart from these, three types of tests are in general use:—

1. The first depends on the ability of the testee to match various colours in which are deliberately included confusion colours, the identification and matching of which present considerable difficulty to the colour-blind. Among the best of these is the original *Holmgren's wool test*, in which skeins of wool are supplied and the testee is required to pick out from the wools those which resemble selected skeins in colour. The method is not quite satisfactory and suffers from several theoretical and practical faults, but nevertheless if it is properly used, and if attention is especially paid to the rapidity and the precision of the judgement of the subjects, a very great deal of information can be gained from it.

2. A modification of this method which possesses considerable advantages and is probably more suited to the practitioner in the consulting room is the test by *pseudo-chromatic diagrams*. Colour-defectives confuse certain colours and colour shades with one another, and on a background composed of coloured spots, numerals or letters are marked out in similar spots of the confusion colour. The test can be made extremely varied and be so composed that various types of colour-blindness can be detected by the failure of the testee to pick out the pattern, or by his appreciation of a pattern different from that seen by the normal person; in this way, by employing a graduated series of diagrams, a very definite idea can be gained of the colour sense. The first set of such diagrams was produced by Stilling (1883), and these were modified and greatly improved by Hertel in 1926. They are obtainable as a small booklet (*Colour Diagrams*, 16th ed., 1926, Leipzig). Probably the most satisfactory and generally useful series of cards, however, are those of Ishihara (*Tests for Colour-Blindness*, 1921, London).

3. The third useful test is by means of a coloured lantern, whereby *coloured lights* are successively exposed to the testee and he is required to name them. The lantern used by the Board of Trade in Great Britain is extremely efficient,

and exhibits seven standard colours : two reds, yellow, two greens, blue, purple, and a clear glass ; over these, modifying glasses can be placed—a ground-glass to represent mist, a ribbed glass to represent rain, and four different intensities of neutral glass to represent fog of varying intensities. Such a test is extremely efficient for the purposes of determining an individual's response to traffic lights in all conditions.

Holmgren's wool test, despite the strictures which have been passed on it, is of great service, and especially as when used as a preliminary test much information can be gathered from a discriminating study of the mistakes made. The more efficient preliminary test, however, is Ishihara's diagrams. But the former test, the picking of skeins of wool, does not appeal to the average workman ; the reading of pseudo-chromatic diagrams requires a considerable amount of intelligence ; and for these reasons the lantern tests are most popular industrially. Undoubtedly the latter form the most reliable and efficient test so far as efficiency in traffic is concerned, but in view of the expense of the apparatus and the difficulty of installing it, it is probable that for the general practitioner the diagrams of Hertel or Ishihara will be found the most universally suitable.

**VOMITING, POST-OPERATIVE.** (See POST-OPERATIVE COMPLICATIONS.)

**WHITLOW.** (See HAND AND ARM, INFECTIONS OF.)

### WHOOPIING-COUGH.

*J. D. Rolleston, M.D., F.R.C.P.*

**The Blood in Whooping-cough.**—L. W. Sauer and L. Hambrecht<sup>1</sup> made a study of the blood-picture in seventy cases of whooping-cough in children whose average age was between 4 and 5 years. The characteristic leucocytosis and lymphocytosis were always found when the paroxysmal stage was at its height, whereas an initial and a terminal leucopenia was seen in almost every instance in which it was sought. During the terminal leucopenia the lymphocyte-count decreased. Similar results were obtained in experimental pertussis in young monkeys. The writers conclude that while early and late leucopenia is an integral part of the blood-picture in pertussis, hæmatological examination is seldom an aid in the early diagnosis of the disease.

REFERENCE.—<sup>1</sup>*Amer. Jour. Dis. Child.* 1931, xli, 1326.

### WORMS, INTESTINAL.

*Robert Hutchison, M.D., F.R.C.P.*

Ch. Garin, J. Rousset, and B. Gauthier<sup>1</sup> find that **Tetrachlorethylene** in doses of 3 to 5 grm. daily for three consecutive days is the most efficient agent in *ankylostomiasis*. During the treatment the patient is kept at rest, all alcohol is forbidden, and milk given freely. Capsules containing 1 grm. of the drug are swallowed each morning at intervals of an hour. On the third day, about three hours after the last capsule, a saline purge (40 grm. of sulphate of soda) is administered. Patients with disease of the heart, liver, or kidneys are not suitable for treatment. The urine should be tested daily three to four hours after the administration of the capsules.

R. W. Lamson<sup>2</sup> and others state that **Hexylresorcinol** given in crystalline form in lard gelatin capsules in doses of 1 grm. for an adult and  $\frac{1}{2}$  grm. for a child, on an empty stomach in the morning and followed by a purge of **Magnesium Sulphate** twenty-four hours later, is a very efficient agent in cases of *ascariasis*. No symptoms of any importance followed the administration. The vermifugal properties of the drug are greatly reduced if it is given in a solvent or if food is taken just before or after it.

After seven years' experience among a people 90 per cent of whom have intestinal parasites, A. H. Kemp,<sup>3</sup> a medical missionary in Angola, Africa, questions the wisdom of the current preliminary fasting and purgation before administering a vermifuge. At his hospital he treats about 1000 cases annually for intestinal parasites—mainly hookworms and ascarides, but also whipworms and tapeworms. At first he was careful to adopt the usual method, but his instructions were often not followed and he found that the results were better. For example, in a case of tapeworm he gave 50 min. of **Carbon Tetrachloride** with a little water and two cathartic pills an hour later. In less than two hours the patient presented himself with a complete tapeworm 8 ft. long. A girl passed 160 ascarides after taking 2 gr. of **Santonin**. Kemp suggests that with the bowel distended with food the drugs have a better opportunity of coming in contact with the head of the parasite than when it is empty and collapsed, with his head possibly buried in some sulcus; also that the mixture with food probably means a longer contact of the drug with the parasite. He has treated 3000 cases with completely satisfactory results by simply administering the vermifuge and giving two cathartic pills an hour afterwards.

REFERENCES.—<sup>1</sup>Abstr. in *Presse méd.* 1931, March 21, 428; <sup>2</sup>Abstr. in *Jour. Amer. Med. Assoc.* 1931, May 23, 1827; <sup>3</sup>*Ibid.* June 6, 1948 (abstr. in *Clin. Jour.* 1931, July 22).

**WRY-NECK, CONGENITAL.** (See TORTICOLLIS, CONGENITAL.)

### **XANTHOMA.**

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

Attention was called in the last volume of the MEDICAL ANNUAL (p. 510) to the observations of Wile, Eckstein, and Curtis to the fact that in xanthoma cases a high blood-cholesterol is not always present. B. Bloch<sup>1</sup> has made further observations on the pathogenesis of this disease. He was able to demonstrate, in 7 cases investigated, a disturbance of lipid metabolism. The disturbances found were either: (1) *In the cholesterol fraction.* The total cholesterol content in one case was increased by about 200 per cent; in 4 cases it was reduced; in 2 cases it was normal; the quotient of free to bound cholesterol in 3 cases was abnormal. Only in one case was the quotient and the total quantity of cholesterol normal (both in the blood and after a dietary test). The lack of cholesterol consequently does not exclude a disturbance in the cholesterol mechanism. (2) *In the phosphatid fraction.* In none of his cases was this normal. (3) *In the neutral fat and fatty-acid fraction.* In 2 cases there was a great increase. (4) *In the results of the dietary tests.* This was done twice, and in both cases it was pathological (once with reference to the cholesterol and once to the phosphatid fraction).

The author therefore concludes that xanthomata arise when the lipid metabolism is disturbed. This disturbance is demonstrated by the fact that the quantitative ratio of the lipid constituents in the blood, and no doubt also in the tissues, is deranged, whilst a proportional increase (or decrease) of these substances has not this significance. A disproportion of this kind leads to a disturbance of equilibrium in the lipid emulsion of the serum, to a coarsening of the particles of the emulsion, and, in the higher degrees, to a separation and finally precipitation of individual constituents in the tissues. Local factors, such as traumata, etc., are of secondary importance. The cause must be located in the disturbance of the regulating mechanism which dominates lipid metabolism. It is not known where this is located or how it functions, but clinical observations seem to point to the liver as the seat of these disturbances.

REFERENCE.—<sup>1</sup>*Brit. Jour. Dermatol. and Syph.* 1931, Feb., 65.

**X-RAY DIAGNOSIS.***C. Thurstan Holland, F.R.C.S.*

The chief event of 1931 from the radiological point of view was the Third International Congress held in Paris under the patronage of the President of the Republic, with Madame Curie as the President of Honour, and with Dr. Antoine Bécélère as the President. It was thought that it would be impossible to surpass the great success of the Second Congress held three years ago in Stockholm, but these radiological Congresses go on from one success to another. The opening ceremony in the Great Hall of the Sorbonne was impressive, and a crowded audience heard an able address from the Minister of Public Health. Madame Curie spoke shortly in reply to an ovation from those present. Dr. Bécélère formally opened the Congress, and received at the hands of Professor Woodburn Morison the Honorary Fellowship of the Royal Society of Medicine and from Professor Schinz an honorary degree from the University of Zurich. Professor Forssell delivered a short address on cancer. Over 400 papers were read in the six sections into which the Congress was divided, and in addition to Professor Forssell's communication on the cancer problem, four invited reports were presented by: (1) Dr. Gregory Cole on the examination of the mucosa of the gastro-intestinal tract; (2) Dr. J. E. A. Lynham on the pre- and post-operative treatment of cancer of the breast by irradiation; (3) Professor Haenisch on the exploration of the urinary tract by the excretion of X-ray-opaque substances; and (4) Professor Milani on the radiotherapy of inflammatory affections. Over 1200 subscribed to membership of the Congress, and these came from some twenty-nine different countries; additionally, a large number of ladies attended many of the social functions.

There was considerable competition as to the place for the next Congress in 1934, and finally the offer of Switzerland to hold this at Zurich was accepted: the President-elect is Professor Schinz.

Apart from the value of these Congresses from the medical aspect, the social aspect must not be overlooked. Paris excelled in this respect both in public and private hospitality. The chief events were: a gala night at the opera; a specially arranged fête at the Colonial Exhibition—at which, incidentally, the band of the Grenadier Guards played; the official dinner attended by about 900; and a reception of the delegates at the Elysée Palace by the President of the Republic. Altogether a memorable meeting, emphasizing very forcibly the important position held by Radiology in Medicine.

**THE BONES.**

**Progressive Myositis Ossificans.**—This is an obscure and rare condition, and that a patient should live to the age of 36 years is very uncommon. J. H. Mather<sup>1</sup> publishes such a case with historical notes of the condition, a fine series of radiographic illustrations, and his own commentaries. One of the points of interest is that this case was radiographically examined in 1897, and one of the radiographs taken at that time is reproduced. The author draws especial attention to the density of the abnormal bone and the thickness of its cortical layer; to the facts that nowhere was there evidence of ossification in the middle of a muscle or tendon, that the ossification appears to start in a muscle or tendon at the point of its attachment to bone; and to its resemblance to diaphysal aclasis.

**Accessory Bones of the Foot.**—A. R. Shands<sup>2</sup> again emphasizes the importance of radiological knowledge concerning the accessory bones of the foot in a paper in which he describes his findings in 1054 X-ray examinations of the bones of the foot and ankle. There is no doubt that there is great need for familiarity with these bones, some twenty-one in number, in view of the frequency of foot injuries and industrial insurance claims. Large sums of money,

as the author points out, are often at stake, and it is amazing how few practitioners and surgeons have accurate knowledge concerning these ossicles. In rather over 22 per cent of the 1034 cases examined accessory bones were shown. The author in this paper deals thoroughly with all the more common ones, introduces a few line drawings as illustration, and discusses his findings as compared with those already reported by a few other writers.

**Osteochondritis.**—A remarkable case of bone abnormality is illustrated and described under the title of "Generalized Osteochondritis" by A. D. Wright.<sup>3</sup> Radiographs of the entire skeleton suggest that in the same case there is: (1) Larssen-Johansson disease of the patellæ; (2) Köhler's disease of the tarsal scaphoid; (3) Kienböck's disease of the semilunar; (4) Sever's disease of the epiphysis of the os calcis; (5) Calvé's disease of the vertebrae; (6) Legg's disease of the femoral heads, amongst other things. It is noteworthy that in this case the pituitary fossa is small, and it is suggested that the condition is most easily explained by an endocrine factor.

**Abnormal Bone Development.**—E. Pyle<sup>4</sup> reports, with radiographic illustrations, an exceptional case of bone development accidentally discovered in a boy of 5 years of age suffering from knock-knee. On examination the long bones of the arms and legs all felt very large and massive at their ends. Radiologically the ends were found to be two or three times their normal size, and whilst the cortex of the shaft was normal it was very thin over the expanded ends. The author has no experience of a similar case and says there is no literature on the subject. The suggestion is that during early growth the usual moulding of the new bone laid down on the shaft sides of the epiphyses has not taken place; and at the same time that the new bone failed to change its shape by resorption, it failed to develop a normal cortex as well. No cause is suggested to account for the condition, which if not unique must be very rare. The good illustrations are very interesting (*Plates LXX, LXXI*).

**The Spine.**—An important paper by H. P. Doub and C. E. Badgley<sup>5</sup> entitled "Tuberculosis of the Intervertebral Articulations" is worthy of note. It is based upon those cases of disease in which narrowing of an intervertebral space, together with very slight X-ray changes in the upper or lower margin of a vertebra, were the only radiographic suggestions of anything being wrong. In none of the cases was there any change in the shape of the vertebral bodies. In two of the cases spinal abscess was present, and inoculated guinea-pigs developed tubercle. This type of the disease is called 'epiphysal tuberculosis of the body of the vertebra' because it involves the area of the body in which the epiphyses occur. The excellent illustrations show the X-ray points very well, and it is easy to see how the diagnosis might be missed.

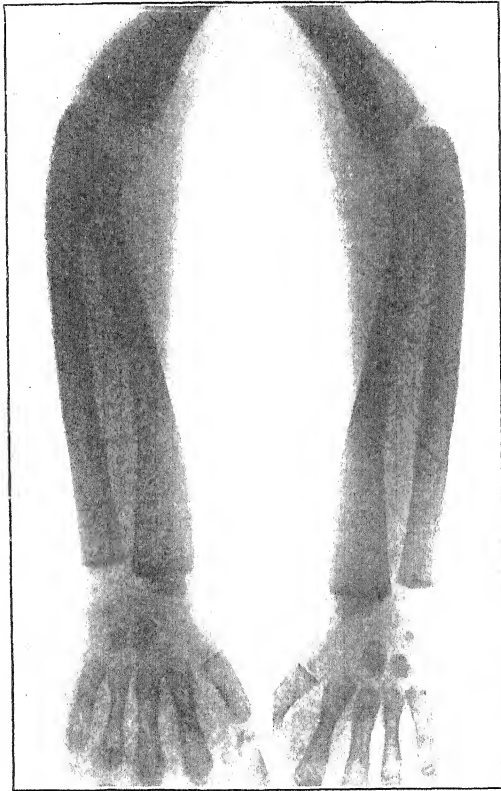
**Köhler's Disease.**—D. M. Faulkner<sup>6</sup> describes a case of Köhler's disease of the tarsal scaphoid from the point of view of the cause. In this case the X-ray appearances were those of Köhler's disease; for reasons described in the report the author decided to operate, and osteitis of the tarsal scaphoid was found, which was proved to be due to *B. tuberculosis*. This is another case which supports the view of Greenwood that this disease is a blood-borne infection of low pathogenicity, really an early and abortive infection of tubercle.

**Osteofibrosa Cystica.**—The connection between a parathyroid tumour and generalized fibrocystic osteitis is emphasized by a case reported by I. Snapper.<sup>7</sup> Full details of this remarkable case will be found in the original paper. Shortly, a man of 56 years was bedridden, and practically dying of 'osteomalacia' with extreme decalcification of the pelvis and femora, plus a spontaneous fracture of a femur. Later radiographs showing the changes of cystic fibrositis of a second metatarsal and the left scapula led to the definite diagnosis of Recklinghausen's disease, which was also supported by the blood

*PLATE LXX*

ABNORMAL BONE DEVELOPMENT

(E. PYLE)

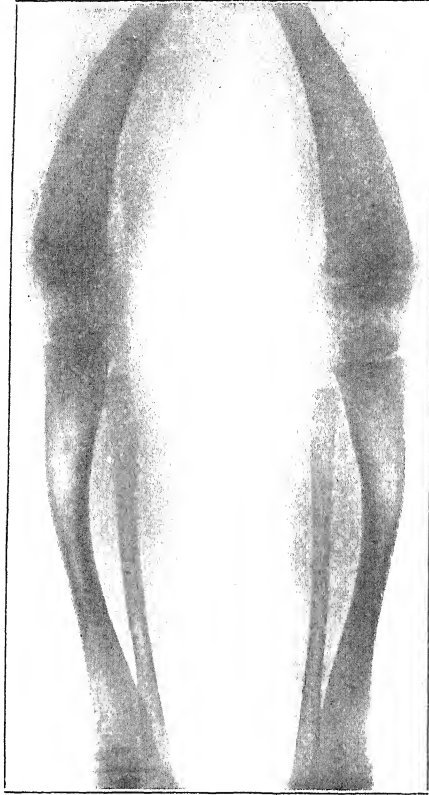


*Plates LXX and LXXI by kind permission of the  
'Journal of Bone and Joint Surgery'*

*PLATE LXXI*

ABNORMAL BONE DEVELOPMENT—*continued*

(E. PYLE)

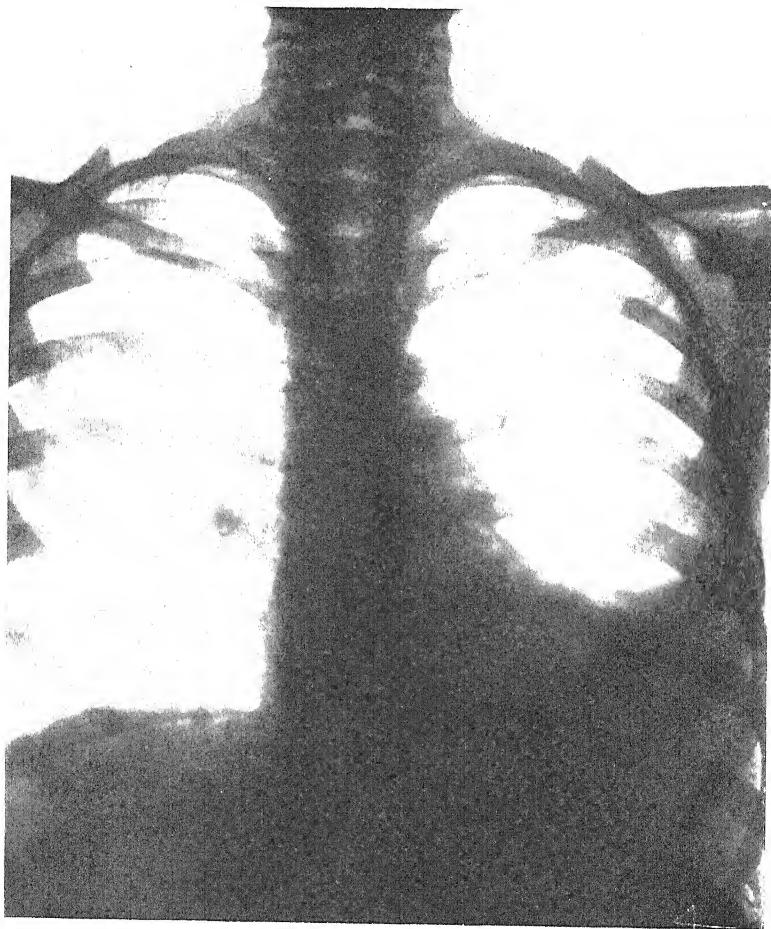




*PLATE LXXII*

PLEURITIC EFFUSION

(C. THURSTAN HOLLAND)

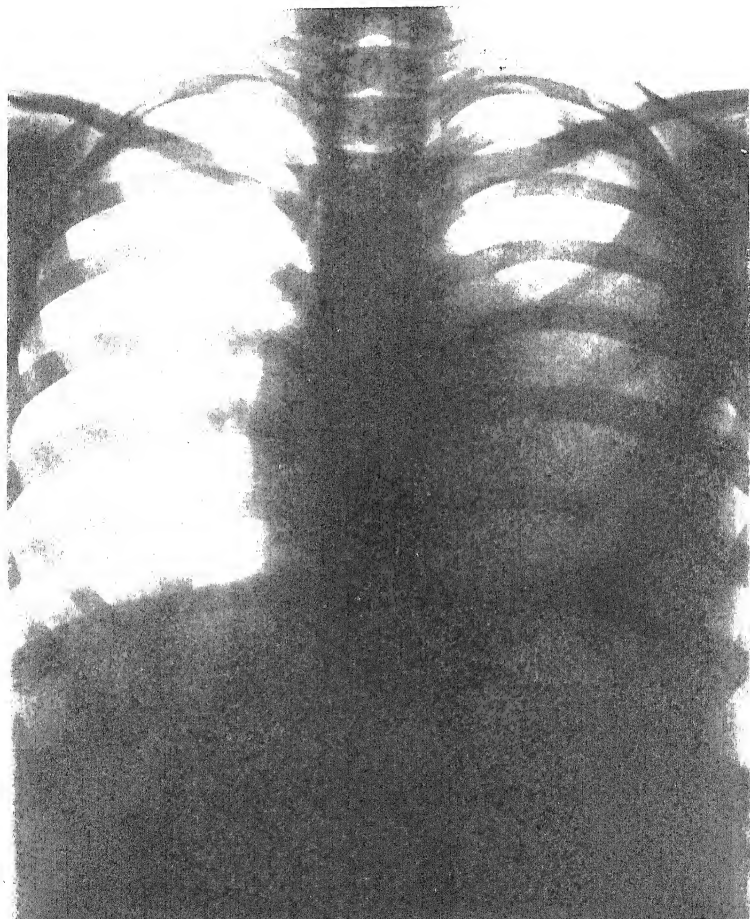


*Fig. A.*—Left side. Standing up.

PLATE LXXIII

PLEURITIC EFFUSION—*continued*

(C. THURSTON HOLLAND)



*Fig. B.*—Same case as *Fig. A.* Left side. Lying down on back.

tests. An adenoma was removed from the left parathyroid, and sixteen months later the man was walking about and felt himself cured. Radiographs showed marked recalcification of the pelvis and femora.

### THE THORAX.

**Pleuritic Effusion.**—L. G. Rigler<sup>8</sup> has carried out a large series of observations on the thorax in cases in which fluid was present. Quoting from the literature on this subject, he draws attention to the wide differences of opinion of various observers, quoting the opinion of many well-known authors that "fluid in the pleural cavity without pneumothorax never moves in any degree in different positions of the patient"—that is, in an ordinary pleural effusion the same X-ray appearances should be found in both the standing-up and lying-down positions. The author has not only used these two positions, but has also utilized the lying-down lateral position and others, and he illustrates his paper with many radiographs taken in all these positions. The paper is of considerable interest and raises many points, but of the many conclusions reached the first is of paramount importance—namely, that "all pleural transudates appear to move with a considerable degree of freedom with change in position of the thorax." [Our own experience coincides entirely with this, and we have taught for years the diagnostic value of examining cases lying down and standing up when a pleural effusion is suggested. There can be no doubt but that, at any rate in children, a difference in the position of the X-ray opacity in the two positions is practically always obtained in cases of ordinary pleural effusion (*Plates LXXII, LXXIII*).—C. T. H.]

**Lipiodol in Lung Investigation.**—Those in the habit of using, or who are interested in using, lipiodol for the examination of the lungs, will find a paper by W. J. Fenton<sup>9</sup> entitled "The Technique of Intralaryngeal Injection of Lipiodol" both useful and instructive. The author considers that the method as described has many advantages, which are enumerated, over any other that has been adopted. This method necessitates anaesthesia of the throat and larynx, and this is obtained by a very simple technique not requiring the use of more than 25 min. of a 5 per cent solution of cocaine. The paper, which is illustrated, explains the simple apparatus, designed to be fool-proof, which is recommended; and the author has arranged this apparatus in such a way that even one unskilled in laryngeal work should easily be able to master the technique.

E. Fletcher<sup>10</sup> has invented, and illustrates, a small instrument to facilitate the injection of lipiodol into the bronchial tree. He describes the technique of his use of this instrument in full, and claims that in nine months it has been found that the method is very rapid and far more comfortable for patients than those previously employed. Always provided that the condition for which the investigation is being made does not necessitate that the patient should be admitted, then he can be treated as an out-patient and allowed to return home afterwards.

P. Franklin and A. Orley<sup>11</sup> suggest an additional method for introducing lipiodol. This is by the nasal route. With the patient sitting up with the neck slightly extended, one nostril, the oropharynx, and the larynx are slightly sprayed with a 4 per cent solution of cocaine. A sterilized catheter can then be gently introduced along the floor of the nose until it reaches the posterior pharyngeal wall, when, with a slightly increased pressure, it passes directly and without any difficulty into the larynx. The authors report that in thirty cases the result has been most satisfactory. The paper describes in detail the full technique and the methods of ensuring that the whole bronchial tree is visualized.

**The Heart.**—D. Steel<sup>12</sup> reports, with radiographic and post-mortem findings, a case of *extreme dilatation of the left auricle*. This condition is a rare one, apparently only fourteen cases having been reported. The author reviews the literature and summarizes the cases previously recorded. The great interest of this case is that a definite diagnosis was made radiologically and confirmed by the post-mortem. The author discusses in detail the X-ray findings, and shows how the correct diagnosis was reached. A series of interesting reproductions of the radiographs taken complete the review of the case.

There is a fund of information of value to the radiologist in a paper by G. Grant Allan,<sup>13</sup> who has made a special investigation of *heart measurement* as carried out by radiological methods in a series of some three hundred cases. In this paper many references are made to the work and opinions of previous writers on the subject, and although the author is very definitely of the opinion that radiology offers a more accurate delimitation of the heart borders than even the most skilled percussion, there is an undercurrent of pessimism shown when it comes to the consideration of the value of many other X-ray observations.

### THE GASTRO-INTESTINAL TRACT.

**The Gastro-intestinal Mucosa.**—For some years increasing work, mostly by foreign radiologists, has been throwing more light upon the pathological changes to be found by radiology in the mucous membrane of this tract; and there appears to be no doubt but that in many cases a considerable amount of diagnostic information is obtainable. In a profusely illustrated paper J. O'Sullivan<sup>14</sup> sets out to sum up the results which can be obtained, and he describes shortly the varying technique essential for the different areas to be examined. This paper refers to the work already done and the papers published, the latter for the most part in German. Those interested in this subject will find valuable information in this communication, the illustrations of conditions of the large bowel being perhaps the most interesting.

In a paper by I. W. Held and A. A. Goldbloom<sup>15</sup> stress is laid upon the fact that in certain cases the examination of the gastric mucous membrane by means of what they term the 'suspension meal' is of great service in reaching a correct diagnosis. They also claim that lesions on the posterior wall of the duodenum, which otherwise would be missed, can be detected. The chief conclusions come to by these authors are that visualization of the mucous membrane shows alterations from the normal in the vicinity of ulceration, and that many small lesions in the stomach not detectable by the usual contrast meal can be discovered when a barium suspension meal is given; that this meal can by no means replace other methods, but that it aids in raising the percentage of peptic ulcers which can be diagnosed radiographically.

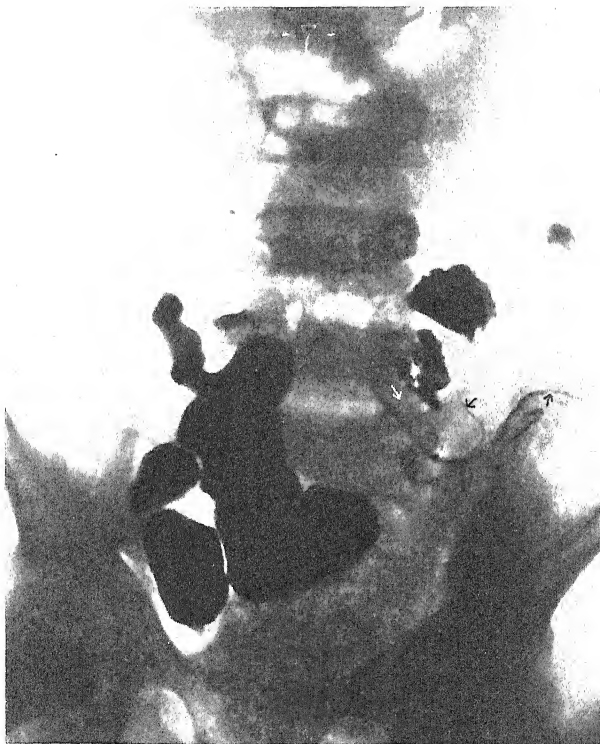
**Ascariasis.**—A well illustrated communication by V. W. Archer and C. H. Peterson<sup>16</sup> draws attention to the fact that, with proper technique, characteristic X-ray appearances can be discovered in a high proportion of children suffering from intestinal ascariasis. A barium cereal meal shows, soon after it has been taken, a cylindrical filling defect in the jejunum, whilst later the barium-filled enteric canal of the parasite shows as a stringline shadow (*Plates LXXIV, LXXV*). The authors consider that radiology supplies a valuable aid to diagnosis in some cases, and have found definite X-ray evidence even in cases in which there has been absence of ova in the stool. References to the literature complete an interesting paper.

**Intestinal Polyposis.**—In the X-ray demonstrations of polypoid lesions and polyposis of the large intestine, H. M. Weber<sup>17</sup> combines the examination of the bowel with an opaque enema and the injection of air, using Fischer's

## PLATE LXXIV

### ASCARIASIS

(V. W. ARCHER AND C. H. PETERSON)



*Fig. A.*—Six hours after opaque meal. Showing barium-filled enteric canals of ascarids.

*PLATE LXXV*

*ASCARIASIS—continued*

(V. W. ARCHER AND C. H. PETERSON)



*Fig. B.*—Typical appearance of ascarids in barium-filled jejunum, showing filling defects and barium-filled enteric canals of parasites.

method with modifications of his own. The technique is fully described and the apparatus explained. The numerous illustrations clearly indicate the different appearances shown by the barium enema alone, and by the additional injection of air: a comparison of these radiographs is instructive. In one case illustrated the opaque enema alone indicated a normal large bowel, whereas the combined method disclosed the presence of a large polypoid mass in the sigmoid. A good bibliography is appended.

**Extra-bowel Pathology.**—Under this title P. F. Butler and M. Ritvo<sup>18</sup> stress the diagnostic importance of X-ray examination of the stomach and intestinal tract in various tumours, etc., which may be found in the abdomen. The distortion or displacement of various parts of the barium-filled gastrointestinal tract will often afford a clue to a correct diagnosis. In their paper they illustrate such conditions as the results of enlargement of the spleen, a hypernephroma, cancer of the pylorus, and so on, as they affect the barium-filled stomach. Radiographs also illustrate deformities, etc., of the bowel from extrinsic causes. The authors emphasize the importance of the evidence to be obtained by this method of observation.

### THE GALL-BLADDER.

**Cholecystography.**—There is nothing very new on this subject, but two papers and a discussion upon them emphasize many important points and reveal some modifications of technique which are worthy of consideration by those interested in the subject. One of these papers emanates from the Mayo Clinic and is by B. R. Kirklin,<sup>19</sup> and in this, which is well illustrated, great emphasis is laid upon errors due to technical lapses. As over 35,000 patients have been examined at this clinic by this method there is ample material from which the writer can draw his conclusions. The oral method of administration has entirely taken the place of the intravenous method, and much stress is laid upon the importance of re-examination in negative and doubtful cases. It is of interest to note that in his description of the technique the author recommends giving the dye in grape-juice immediately or very soon after a supper of ordinary amount, but which should contain no eggs, cream, butter, or other fats.

The second paper is by W. H. Stewart and H. E. Illick,<sup>20</sup> and it also is beautifully illustrated. This paper is based upon five years' experience of the oral method, which has been found entirely reliable as checked by operative findings. In the main, except for slight differences in technique, the authors of both these papers are in agreement.

**Double Gall-bladder.**—Paul Cave<sup>21</sup> reports two cases of this rare developmental anomaly. These two cases are claimed to be the first diagnosed by cholecystography in England, but a few have been reported in American journals. Also a few cases have been found at operation and at post-mortem. Graham has not found a single example in a series of 1218 cases examined by cholecystography. The author illustrates this paper and gives references to the literature.

**Papilloma.**—B. R. Kirklin<sup>22</sup> has been able by means of the cholecystographic method of examination to diagnose papillomas of the gall-bladder, and in four cases which went to operation this X-ray diagnosis proved to be correct. The author insists on the importance of technique, the diagnostic signs being as a rule best seen at the twentieth hour after the administration of the drug. Very good radiographs illustrating this paper clearly demonstrate the shadow defects on which the diagnosis is based. Further, the author is of the opinion that it is not extravagant to hope that eventually cholecystography will reveal the presence of early, operable, carcinomas of the gall-bladder.

## HYDATID DISEASE.

The paper by J. F. Brailsford<sup>23</sup> on hydatid disease in England is of exceptional interest in many ways. The author has made an intensive study of the disease as seen in the viscera of animals killed in the public abattoir of Birmingham over a series of years, and it is somewhat disconcerting to hear from him of the numerous cases in which cysts were found, and the ease with which dogs were able to obtain this infected meat as food. Indeed, his account of existing conditions leaves one rather amazed that hydatid disease in this country is so comparatively rare amongst human beings. Anyone interested in this disease will find this paper, with its many beautiful illustrations, full of interesting points and facts. His chief conclusions are that: (1) Hydatid disease in this country is not rare; (2) It has a high mortality rate; and (3) It could easily be entirely eradicated.

## HEPATO-SPLENO-RADIOGRAPHY.

The removal of finely particulate matter introduced into the blood-stream by the reticulo-endothelial system is well recognized. This fact has recently been made use of by P. Radt<sup>24</sup> for the radiological visualization of the liver and spleen. **Thorium Dioxide** when injected intravenously is rapidly and almost completely absorbed by the reticulo-endothelial cells; and the two organs, liver and spleen, where these cells are present in greatest numbers, are rendered radiologically visible by virtue of the opacity of the contained thorium dioxide.

Following the work of P. Radt, P. H. Whitaker, F. Murgatroyd, and T. B. Davie, at the Royal Infirmary, Liverpool, have used samples of the thorium dioxide preparation he recommends (Chemische Fabrik von Heyden) in animal experiments, and find that the density of the radiological shadow varies with the amount of material injected. Large doses are tolerated by rabbits without any apparent ill effects. The liver and spleen are well shown up on radiographs (*Plate LXXVI*), and the latter organ shows a fine mottling apparently due to the distribution of the Malpighian corpuscles. The reticulo-endothelial cells of the liver and spleen alone absorb the thorium dioxide in any concentration. None could be demonstrated in the bone-marrow of the ribs or long bones, nor in the lymphatic glands. The thorium dioxide, once deposited, remains in the reticulo-endothelial cells and is not excreted to any noticeable extent. There is no loss in the density of the shadow after six months in rabbits, and after at least three months in humans. These observers have used the injections in two human cases, the dose being 10 c.c. repeated on successive days. The liver was radiologically demonstrable after the first dose of 10 c.c. and clearly visualized after 30 c.c. had been injected, the radiograms being taken twenty-four hours after the injection (*Plate LXXVII*). The patients complained of no ill effects and the blood showed no change beyond a slight transient eosinophilia.

In one of the patients who died of a large retroperitoneal sarcoma five weeks after the injections, certain changes were discovered in the liver which are reported below. A slice of this liver  $\frac{3}{4}$  in. in thickness was radiographed simultaneously with similar slices from two other livers, one being a normal liver and the other a liver with multiple metastatic carcinomatous nodules. The enhanced density of the shadow thrown by even this thin slice of thorium-injected liver was well shown.

Histologically the liver presented a picture which was deemed sufficiently important to be placed on record and to require further investigation. Under the low-power objective of the microscope the outstanding feature was the



*PLATE LXXVI*

HEPATO-SPLENO-RADIOGRAPHY

(P. WHITTAKER, F. MURGATROYD, AND T. B. DAVID)



*Fig. A.*—Schiagram to show liver and spleen of a rabbit after injection of thorium dioxide.

**PLATE LXXVII**—HEPATO-SPLENO-RADIOGRAPHY—*continued*  
(P. WHITAKER, F. MURRAYROD, AND T. B. DAVIS)

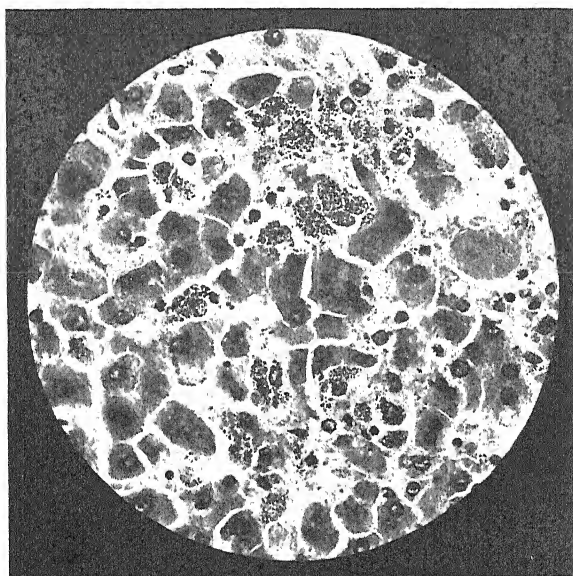


*Fig. B.*—Liver and spleen rendered opaque by injection of thorium dioxide.

*PLATE LXXVIII*

HEPATO-SPLENO-RADIOGRAPHY—*continued*

(P. WHIFAKER, F. MERGATROYD, AND T. B. DAVIE)

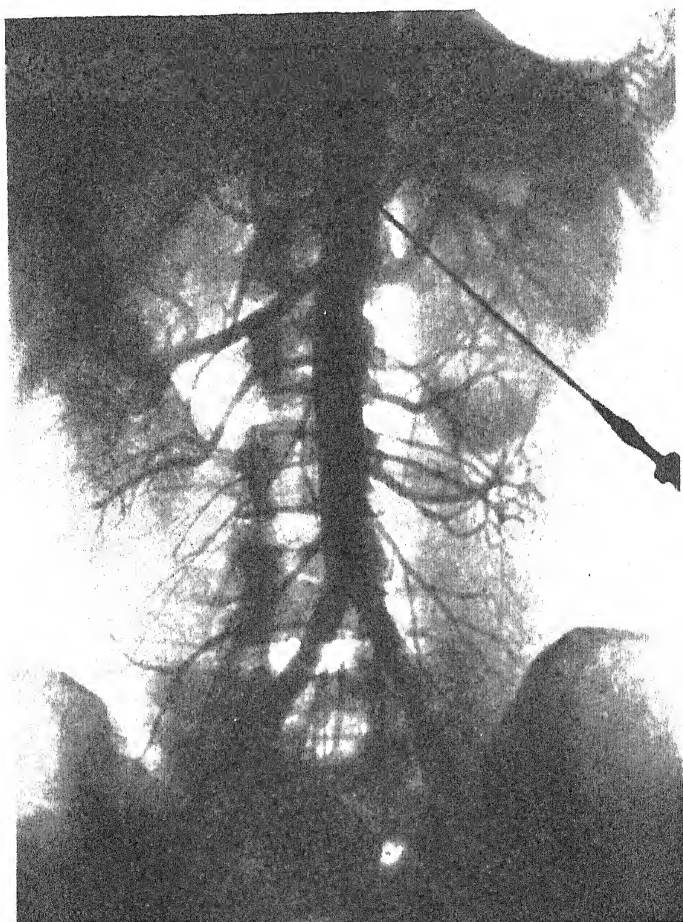


*Fig. C.*—Microphotograph showing diffuse necrosis of liver cells five weeks after the injection of thorium dioxide. ( $\times 300$ .)

## PLATE LXXIX

### RADIOGRAPHY OF THE ABDOMINAL AORTA

(R. DOS SANTOS, C. LAMAS, AND P. CALDAS)



Normal radiographic appearance of the abdominal aorta after injection with sodium iodide.  
Note the position of the puncture and the aortic reflux during diastole.

*[By kind permission of 'La Presse médicale']*

apparent loss of lobular structure and the marked dissimilarity of size of the liver cells. At higher magnifications the cause of this loss of orderly arrangement was seen to be a diffuse patchy necrosis of hepatic cells, with evidence suggestive of regeneration in places. These changes were most marked in the immediate vicinity of collections of refractile granular masses which these workers believe to be the injected thorium, stored in the Kupffer cells. These granular masses can be distinctly seen in the accompanying microphotograph (*Plate LXXXVIII*), and while most appear to lie free in the sinusoidal spaces, in some the nuclei of the Kupffer cells are still in evidence. They are present in larger numbers than the somewhat similar masses of bile pigment found in most livers not obviously jaundiced. They also differ from bile-pigment masses in the absence of the greenish coloration and in the distinctness of their granularity. The hepatic cells in the neighbourhood show all degrees of degeneration, from pyknosis and karyolysis of the nuclei to complete disintegration of the cell. In places, mixed with necrotic cells are large fresh-looking hepatic cells. These appear to be the result of regenerative processes, for which the time which elapsed between the injection and the death of the patient was ample. The slight degree of fatty change in the sections is not limited to any particular portion of the lobule, though on the whole it is more central than peripheral.

The possibility of these findings in the liver being due to the toxæmia of the double lesion—namely, infected sarcoma and confluent bronchopneumonia—has not been overlooked; but it is felt that the appearances described above present a sufficiently abnormal and unusual picture to call for caution in the use of thorium injections as an aid to the diagnosis of those hepatic and splenic lesions which, by the nature of things, are almost certain to be associated with some degree of toxæmic damage to one or both of these organs.

E. E. Bauke<sup>25</sup> utilized this method of diagnosis in the case of an obscure abdominal tumour, apparently calcified, which had accidentally been discovered by X rays. The liver and spleen were clearly defined after the injection of 60 c.c. of thorium dioxide solution given in five doses at intervals of one or two days. The tumour was found to be centrally situated in the spleen and was probably a calcified hydatid cyst or tuberculous. The point is, of course, the demonstration of the exact site of a tumour, which was not possible by any other means.

A large series of experiments on animals has been carried out by S. Kadruka and J. Rossier<sup>26</sup> with a substance called **Thorotrast**, a colloidal suspension of particles, with a negative electric charge, of a non-toxic thorium salt. With large doses not only did the liver and spleen become X-ray opaque, but also the bone-marrow and the kidneys. Whilst small and apparently harmless doses opacified the liver and spleen, the large doses damaged the parenchyma and the glomerules of the kidneys. Hepato-splenography has been successfully applied by the authors to clinical medicine, and especial importance is laid on the way of giving the thorotrast: dilution, small doses, and protracted time are all essential. This paper is illustrated by many radiographs and the results of microscopic examinations.

#### MISCELLANEOUS.

**Opaque Injection into Arteries.**—In the early days of X-ray work many experiments were made in injecting the blood-vessels of the cadaver with substances opaque to X rays; it is only in the last few years that attempts have been made, both on animals and on man, to inject the living arteries with non-toxic iodine substances and so obtain radiographs of the arteries during life. Three Portuguese investigators have carried this method very far, and

report the results of their work in a beautifully illustrated article. R. dos Santos, C. Lamas, and P. Caldas<sup>27</sup> describe the technique so far reached, and the instruments used, in an article in which some very striking illustrations show the results attainable. The injection is made into the abdominal aorta with a long syringe and under local anaesthesia, after tourniquets have been applied to the femoral arteries: 20 grm. of **Abvodil** (the usual dose in intravenous kidney examination) is introduced and stereoscopic radiographs made during the injection. The radiographs show the abdominal aorta and its branches (*Plate LXXIX*), including the arteries of the kidney and uterus. The illustrations include normal radiographs and also a few in which pathological processes had produced alterations in the vessels. [We hardly consider that this method of X-ray examination is likely to come into either frequent or general use, but it is quite possible that in some obscure cases of abdominal tumour it would be an aid to diagnosis. In any case the paper quoted is extraordinarily interesting.—C. T. H.]

E. Moniz, L. de Carvalho, and A. Lima<sup>28</sup> have passed a long sound from the arm into the right auricle (following Forssmann's method), and, retarding the circulation in the legs, other arm, and the neck, injected 8 c.c. of an 80 per cent **Sodium Iodide** solution into the heart. Radiographs of the lungs showed the pulmonary vessels, and it is claimed that the method might assist diagnosis in vascular and other tumours, and investigation of certain forms of tuberculosis.

**Medico-Legal Radiology.**—A. Howard Pirie<sup>29</sup> publishes a paper on the value of X-ray diagnosis in medico-legal cases which should be of especial value to the general practitioner. There is nothing particularly new in this paper, and little, if anything, which should not be well known to the radiologist of experience, but the author epitomizes the subject very successfully, and his account of the various conditions which may, and often have, led to confusion and mistakes is terse and sound. Not the least interesting part of this paper is an account of a few cases in which the author's expert knowledge led to claims for compensation for supposed injuries being abandoned. This article is one of the most common-sense papers on the subject which has as yet appeared in print.

**The Accessory Nasal Sinuses.**—The apparatus designed by, and the technique used by, Graham Hodgson<sup>30</sup> for the radiography of the accessory nasal sinuses has revolutionized previous X-ray methods in this branch of radiography. Whilst based upon the old chair method designed by Martin Berry many years ago, it has gone far beyond this, and the use of the modern tubes and the Potter-Bucky diaphragm has made it possible to reproduce standard radiographs in standard positions with almost uncanny accuracy (*Plate LXXX*). We must refer readers to the original paper, which is profusely illustrated with both photographs and radiographs, for the technique and the results; but there can be no doubt that the author's methods must entirely displace all those which have preceded them. In summarizing the paper the author lays stress upon four points. These are: (1) That for the sake of comparison and the reading of results the positions must be absolutely standardized for all patients. [His apparatus makes this simplicity itself.—C. T. H.] (2) That the erect posture of the patient is an essential. (3) That six standard positions are essential to include all the accessory nasal sinuses. (4) That the radiographs must be technically perfect.

In a paper illustrated by radiographs to accentuate the various points raised, G. E. Richards<sup>31</sup> strongly advocates the use of **Lipiodol in Olive Oil** as being of immense use in increasing the accuracy of X-ray diagnosis in cases of antrum trouble. In his opinion the lipiodol should be diluted with at least four parts of olive oil, and he considers the method of its introduction into the antrum is

PLATE LXXX

RADIOGRAPHY OF THE NASAL SINUSES

(GRAHAM HODGSON)



*Fig. A.*—Occipito-mental view. A, Frontal sinuses; B, Anterior ethmoid cells; C, Maxillary antra.



*Fig. B.*—Upright position. Occipito-mental view. Note horizontal fluid level in both antra. A polypus is seen projecting above the inner extremity of the fluid level in the left antrum.

*By kind permission of the  
'British Journal of Radiology'*

*PLATE LXXXI*—FIBROIDS OF THE UTERUS  
(X-RAY DEPARTMENT, ROYAL INFIRMARY, LIVERPOOL)



Calcareous deposits in fibroids in the posterior wall of the uterus.



of the utmost importance, inasmuch as it should be done through a proper antrum puncture and under direct pressure. Full details of the method and the results to be obtained are set forth in this paper, as also are the various conditions of the antrum in which it is of valuable diagnostic help.

R. C. Beeler, L. A. Smith, and J. N. Collins<sup>32</sup> strongly advocate the use of lipiodol in the X-ray investigation of antral disease in those cases in which a primary plate is inconclusive. They report on their results in the study of over 300 cases, saying that the injection can be made without any harmful effects and that it is most valuable as a means both to accurate diagnosis and to determining the proper lines of treatment. This paper is illustrated by many good radiographs, and a short bibliography is added.

#### Obstetrics.—

*General Uses.*—Without containing anything especially new the paper by N. Hypher<sup>33</sup> on the diagnostic value of radiology in obstetric practice should be of interest and value to general practitioners especially. The author epitomizes his findings during three years of X-ray work carried out for Queen Charlotte's Hospital, and illustrates his paper with some thirty excellent pictures of various conditions and the summary of many cases. For the very various conditions in which a radiological examination is either diagnostic or extremely helpful reference should be made to this paper; two examples are almost dramatic: (1) A stout multiparous woman at the climacteric was convinced that she was the victim of pseudocyesis by being shown a negative radiograph. (2) An unmarried girl diagnosed as being pregnant by a doctor was proved—teeth being present—to have a dermoid cyst of the ovary. (See Plate LXXXI.)

*Pelvic Measurement.*—An accurate, simple, and very inexpensive method of radiographic pelvimetry has been worked out by L. A. Rowden.<sup>34</sup> Very many papers have been published upon this subject, especially in foreign journals, but for simplicity of technique combined with accuracy and cheapness it is probable that this method is the best of them all, and the easiest of application. In a well-illustrated paper the author lucidly explains the exact details, and his illustrations aptly amplify the text. Any possible margin of error is so small as to be negligible. One of the very great advantages is the minimum discomfort to the patient. The author is of the opinion that it should become a routine for all women, and that it should be done very early on in all pregnancies.

Another paper on the same subject, and including *cephalometry* also, is by H. J. Walton.<sup>35</sup> The method is recommended after a two years' trial on account of its simplicity and practicability. It is based on a specially constructed chart devised by the writer, which is reproduced, together with photographs of the X-ray technique, in the article. The author stresses the point that no complicated apparatus is required, and that the method is rapid and easy, and unobjectionable to the patient.

REFERENCES.—<sup>1</sup>*Brit. Jour. Radiol.* 1931, May, 207; <sup>2</sup>*Radiol. Review*, 1931, Aug., 191; <sup>3</sup>*Proc. Roy. Soc. Med.* 1931, 283; <sup>4</sup>*Jour. Bone and Joint Surg.* 1931, Oct., 874; <sup>5</sup>*Amer. Jour. Roentgenol.* 1931, March, 299; <sup>6</sup>*Jour. Bone and Joint Surg.* 1931, April, 369; <sup>7</sup>*Bruzelles-méd.* 1931, March, 585; <sup>8</sup>*Amer. Jour. Roentgenol.* 1931, Feb., 220; <sup>9</sup>*Lancet*, 1931, ii, 230; <sup>10</sup>*Brit. Med. Jour.* 1931, ii, 846; <sup>11</sup>*Ibid.* 1931, ii, 847; <sup>12</sup>*Amer. Jour. Roentgenol.* 1931, July, 66; <sup>13</sup>*Proc. Roy. Soc. Med.* 1931, 1211; <sup>14</sup>*Med. Jour. Australia*, 1931, i, 685; <sup>15</sup>*Amer. Jour. Roentgenol.* 1931, July, 74; <sup>16</sup>*Jour. Amer. Med. Assoc.* 1930, Dec., 1819; <sup>17</sup>*Amer. Jour. Roentgenol.* 1931, May, 577; <sup>18</sup>*Ibid.* April, 474; <sup>19</sup>*Ibid.* May, 595; <sup>20</sup>*Ibid.* 602; <sup>21</sup>*Lancet*, 1931, i, 751; <sup>22</sup>*Amer. Jour. Roentgenol.* 1931, Jan., 46; <sup>23</sup>*Brit. Jour. Radiol.* 1931, 440; <sup>24</sup>*Med. Klin.* 1930, xxvi, 1888; <sup>25</sup>*Deut. med. Woch.* 1931, July, 1148; <sup>26</sup>*Acta Radiol.* 1931, xii, 369; <sup>27</sup>*Presse méd.* 1931, 574; <sup>28</sup>*Bull. de l'Acad. de Méd.* 1931, 627; <sup>29</sup>*Brit. Med. Jour.* 1930, ii, 722; <sup>30</sup>*Brit. Jour. Radiol.* 1931, Sept., 421; <sup>31</sup>*Ibid.* March, 120; <sup>32</sup>*Amer. Jour. Roentgenol.* 1931, Aug., 202; <sup>33</sup>*Brit. Jour. Radiol.* 1931, April, 171; <sup>34</sup>*Ibid.* 1931, Sept., 432; <sup>35</sup>*Amer. Jour. Roentgenol.* 1931, June, 758.

**X-RAY THERAPY.***C. Thurstan Holland, F.R.C.S.*

**Cancer of the Breast.**—A paper, mainly statistical, on X-ray therapy in cancer of the breast by G. E. Pfahler and L. D. Parry<sup>1</sup> is worthy of careful consideration. The material used is 977 cases seen in private, and it is evident that great trouble has been taken both in careful note-taking and in methodical following up. A large number of elaborate tables show the various results which can be obtained. The cases extend over a period of twenty-five years, and it is obvious that the later results are more favourable than the earlier ones. The chief conclusions arrived at are that: (1) Pre-operative treatment renders many inoperable cases operable. (2) Post-operative irradiation gives a general average of all cases of over 50 per cent five-year recoveries, whilst the more modern technique raises this percentage to 75. (3) The modern treatment yields an average of 28½ per cent five-year recoveries in recurrent and metastatic cases. (4) In primary inoperable cancer 30½ per cent of five-year recoveries can be obtained. (5) 85 per cent of five-year recoveries followed on the treatment of 39 operable cases in which for one reason or another operation was not done. [The salient feature of this paper is its optimism, but it is arguable whether an interval of five years only is a long enough one on which to estimate the true result of any treatment in cases of breast carcinoma.—C. T. H.]

**Osteogenic Sarcoma.**—An extensive paper by G. E. Pfahler and L. D. Parry<sup>2</sup> on the treatment of osteogenic sarcoma by means of irradiation is comprehensive and useful. Although radium was used in some of the cases, in most the treatment was carried out by X rays. The paper is profusely illustrated with radiographs and is full of instruction and interesting points. Two of these points are of supreme importance: one is that it is agreed that whilst a biopsy can often be helpful in making a correct diagnosis in any individual case, the radiographic examination is often of either equal or even greater importance; and that the history and radiographs taken together may be more decisive than a number of microscopic sections. The other point is that whilst a biopsy preceding operation or radiation treatment is so dangerous that it should not be done, after a preliminary period of irradiation for over a month it can be made without any danger. This paper is based upon a study of fifty-eight cases of osteogenic sarcoma, and similar work in other clinics is reviewed. It is claimed that the results from irradiation seem to be at least as good as, and probably better than, those obtained by surgery alone. An extensive bibliography is added.

**Ovarian and Testicular Cancer.**—The paper by J. H. Douglas Webster<sup>3</sup> on ovarian and testicular cancers and their response to X-ray treatment, raises many points of interest. It is well known that clinically both of them are of a high grade of malignancy and yet singularly radio-sensitive. The author discusses his results in thirty-nine cases of ovarian disease and in thirty-one cases of testicular cancer. His cases of ovarian trouble in which any reasonably effective result was possible are few in number, but the author confirms the opinion of Heyward and others that post-operative radiation of ovarian tumour leads to a definite improvement in end-results; he also considers that there is a case for pre-operative treatment. In the case of testicular tumour X-ray treatment is remarkably successful, and in the post-operative group he can produce cases as being quite well even as long as eight and seven years after operation; whilst in the control, and sometimes cure of, massive testicular recurrences, radiation treatment has some of its most dramatic successes to record. Cases are quoted and illustrated and the X-ray treatment is described.

**Leukæmia.**—T. Dale<sup>4</sup> has been treating cases of leukæmia for the past two

years by a new method. The chief point is that from a distance of one metre, and through a filter of 0.5 mm. zinc, the whole body is irradiated, the head, neck, and genitals being protected during each exposure. All details of dosage etc., are to be found in the paper, and the author claims that four cases of myelogenous leukaemia were improved in which previous treatment applied locally to the spleen had been ineffective. The claim is made that this general irradiation is superior to local X-ray treatment because it is less severe for the patient, and because it enables the patient to keep up his work for a longer time. (*See also* LEUKAEMIA.)

**Thrombophlebitis.**—In the X-ray treatment of this condition remarkable success is claimed by J. Halban,<sup>5</sup> who has treated seventeen cases of thrombophlebitis of the lower extremities. The exact technique is described, and very small dosage brought about the successful results. Severe pain was promptly relieved and the inflammatory process rapidly disappeared, the course of the disease being definitely shortened. His results include five cases of thrombosis of the deep veins able to walk within thirteen to twenty-six days, and so on.

**Melanotic Tumours.**—A very instructive and interesting account is given by W. A. Evans and T. Leucutia<sup>6</sup> of the treatment of melanotic tumours of the skin. Contrary to what is usually believed, these authors are emphatic in their belief that X-ray treatment is the treatment of choice. A large number of cases are illustrated, the treatment adopted explained, and the results indicated. Many authors are quoted with reference to their varied opinions on methods of treatment, and a comparison is made between the results of X-ray therapy (as carried out by the authors) and those obtained by other means. A definite distinction is made between the ordinary congenital pigmented moles and the malignant melanomas (melanosarcomas), and it is in these latter cases that a claim is made that they are best treated by radiation therapy, sometimes in selected cases combined with operation.

**The Eye.**—K. Takemura<sup>7</sup> has treated with success, by means of X rays, a case of tuberculous dacryocystitis. Full details of technique are given, cure, complete and lasting, following six treatments given over a period of about eight weeks. Incidentally this author remarks that more and more attention is being paid in Japan to the treatment of various eye conditions by X rays. He instances such conditions as palpebral diseases, trachoma, lesion of the lachrymal sac, and so on.

**Sycosis.**—R. Foster Moore<sup>8</sup> reports a case in which, following on X-ray treatment for severe sycosis of the scalp, face, and neck, and in which complete cure resulted, telangiectases gradually appeared, and in three years after the last X-ray dose cataract was fully established in both eyes. This occurred in a man, age 28 years, and both eyes were operated upon. Full details of the X-ray exposures are given, and references made to other cases of cataract caused by X rays.

**The Fœtus.**—The effect of X rays on the offspring is discussed by H. Guggisberg,<sup>9</sup> who begins by analysing all the literature bearing upon this subject. He deals with the possibilities of injury to the fœtus, to the germ plasma, and to the future generation. He considers that the destructive effect of irradiation during pregnancy cannot be doubted, and great care must be exercised against making unnecessary and prolonged diagnostic exposures. If deep X-ray therapy has been given to a pregnant uterus owing to a diagnostic error, then abortion is probably indicated. Temporary sterilization is entirely condemned.

REFERENCES.—<sup>1</sup>*Ann. of Surg.* 1931, Jan., 412; <sup>2</sup>*Amer. Jour. Roentgenol.* 1931, June, 761; <sup>3</sup>*Practitioner*, 1931, June, 636; <sup>4</sup>*Acta Radiol.* 1931, July, 263; <sup>5</sup>*Wien. klin. Woch.* 1930, Nov. 6, 1368; <sup>6</sup>*Amer. Jour. Roentgenol.* 1931, Aug., 236; <sup>7</sup>*Ibid.* 1931; <sup>8</sup>*Proc. Roy. Soc. Med.* 1931, April, 759; <sup>9</sup>*Schweiz. med. Woch.* 1930, March, 213.

**YEAST-LIKE INFECTIONS OF THE SKIN.** (See SKIN, FUNGUS AFFECTIONS OF.)**YELLOW FEVER.**

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

**ETIOLOGY AND TRANSMISSION.**—The identity of the lesions of yellow fever in Africa and America is confirmed by studies of the pathological lesions by O. Klotz and T. H. Belt.<sup>1</sup> The endemicity of the disease in West Africa has been studied by H. Beeuwkes, J. H. Baur, and A. F. Mahaffy<sup>2</sup> of the West African Yellow Fever Commission by means of injecting susceptible rhesus monkeys with the serum of persons in the endemic areas, followed by yellow fever virus in the blood of recently infected monkeys, for it has been proved that sera of those who have suffered from yellow fever as long as twenty years previously will protect against many lethal doses of the virus. Only when both monkeys were thus protected was the test regarded as evidence that the person from whom the protecting serum had been obtained must have previously suffered from an attack of yellow fever. A long series of such experiments showed that in the Ibadan and Ilorin regions of South Nigeria 30.4 per cent of the sera tested protected duplicate animals; and in Ife, where epidemic yellow fever had recently occurred, no less than 68 per cent showed evidence of having recovered from an attack of yellow fever. Further, one in every four children showed similar immunity, so the results furnish strong evidence of the endemicity of yellow fever in South-western Nigeria. The clinical recognition of mild yellow fever in children is complicated by their nearly all suffering from febrile malaria, and 50 per cent also with schistosomiasis with albumin in the urine. Other tests carried out in Kano in North Nigeria, and in Sierra Leone, indicated that yellow fever had also occurred in those localities in recent years through their close communications with places in which yellow fever epidemics have occurred within the last few years. M. Frobisher<sup>3</sup> reports further observations on the filterability of yellow fever virus, from which he concludes that "yellow fever mosquito-virus will pass through Berkefeld 'V' filters when suspended in distilled water (pH 6.4), physiological sodium chloride solution (pH 6.2), or phosphate buffer solution (pH 7.8)."

N. C. Davis and R. C. Shannon<sup>4</sup> record further experiments on the mosquito carriers of yellow fever; from these they conclude that *Aedes fluviatilis* is a good carrier and that *A. taeniorhynchus* is a less efficient one, but *Sabethine* mosquitoes failed to infect by their bites. N. C. Davis<sup>5</sup> also reports on the possibility of immunity in *Stegomyia* mosquitoes after a feed of immune blood, with negative results. The same worker<sup>6</sup> has experimented further with the monkeys of the New World, and succeeded in infecting a red howling monkey (*Alouatta seniculus*) with yellow fever through mosquito bites, with development of immunity in the animal, and a rhesus was infected from it during the febrile stage. More variable results were obtained with other species of New World monkeys. G. M. Findlay and E. Hindle<sup>7</sup> report finding an increase of guanidine-like substances in the blood of yellow fever monkeys, similar to those associated with liver necrosis. Calcium lactate reduced their amount and lessened the tendency to hæmorrhages, but did not save the lives of the animals. E. Hindle<sup>8</sup> has summarized recent work on the transmission of yellow fever which has already been dealt with in this ANNUAL. C. B. Philip<sup>9</sup> deals with the possibility of the mechanical transmission of yellow fever experimentally by insects by allowing them to feed partially on infected animals and immediately transferring them to complete their feeds on healthy ones, but his results with both *A. ægypti* and *C. lenticularis* were negative, so he regards the chances of direct infection in this way as being very remote. Max Theiler<sup>10</sup> has studied the effects of yellow fever virus in mice, and found that when it is injected

into the brains of mice it produces an encephalitis with specific eosinophilic nuclear changes in the ganglion cells. The virus can be maintained indefinitely by brain-to-brain passages with a loss of virulence for monkeys, and the action of immune yellow fever sera can be demonstrated by injecting a mixture of immune serum and virus into the brains of mice. Moreover the sera of thirteen convalescent yellow fever patients showed a greater or less neutralizing action on the yellow fever virus.

*Laboratory infections* are reported on by A. W. Burke,<sup>11</sup> who records four Brazil cases, one through the bite of an infected mosquito, one probably during an autopsy on a monkey, and the remaining two through contact with the blood of infected animals. Immune serum given after the onset of the disease appeared to have been of undoubted therapeutic value, and prophylactic immune serum possibly played a large part in the recovery of a third case. G. C. Low and N. H. Fairley<sup>12</sup> report three cases of yellow fever infection in the London Hospital for Tropical Diseases through laboratory infections from a Brazilian strain; two acquired the disease in the hospital during routine blood examinations, with an incubation period of ten days, and death followed in one case. The use of rubber gloves when dealing with infected blood is urged.

H. Beeuwkes and T. B. Hayne in West Africa<sup>13</sup> have demonstrated the infectivity with the yellow fever virus of captured *A. aegypti* by infecting a monkey by injecting it with an emulsification of 143 caught insects; but as other injection and feeding experiments were negative they do not regard this as a practical test of the presence of the disease in a town.

REFERENCES.—<sup>1</sup>*Amer. Jour. Trop. Med.* 1930, Sept., 299; <sup>2</sup>*Ibid.* 305; <sup>3</sup>*Ibid.* 1931, March, 127; <sup>4</sup>*Ibid.* Jan., 21; <sup>5</sup>*Ibid.* 31; <sup>6</sup>*Ibid.* March, 113; <sup>7</sup>*Lancet*, 1930, ii, 678; <sup>8</sup>*Ibid.* 835; <sup>9</sup>*Ann. Trop. Med. and Parasitol.* 1930, Dec. 18, 493; <sup>10</sup>*Ibid.* July 8, 249, and 1931, March 31, 69; <sup>11</sup>*Amer. Jour. Trop. Med.* 1930, Nov., 419; <sup>12</sup>*Brit. Med. Jour.* 1931, i, 125; <sup>13</sup>*Trans. Roy. Soc. Trop. Med. and Hyg.* 1931, Aug. 8, 107.

**ZONDEK-ASCHHEIM TEST FOR PREGNANCY.** (*See PREGNANCY AND ITS COMPLICATIONS.*)

## II

## THE PRACTITIONERS' INDEX.

## NEW PHARMACEUTICAL PREPARATIONS, AND SURGICAL APPLIANCES, ETC.

*In this Section we give short descriptions of the Pharmaceutical Products and the New Inventions of the past Year. Every care is taken to notice only articles that seem worthy of our readers' attention. It should be understood that the information is supplied by the Makers, and can appear but once in this section.*

*We invite all concerned with the Medical Manufacturing Industries to co-operate with us in making this section valuable for present and permanent reference.*

*A short typewritten description of each article is required, with the advantages claimed for it, and with the Maker's name and address appended. Illustrations of Instruments may be inserted if small. More extended information may be included in the advertisement pages if desired.*

*In the section on Drugs, their composition, principal applications, and dosage should be stated in the fewest possible words.*

*All particulars for this Section should reach us by November 30.*

## PROGRESS OF PHARMACY, DIATETICS, Etc.

**Abrodil** is mono-iodo-methane sulphonate of sodium, an organic compound containing 52 per cent of iodine in firm combination. It is used for intravenous pyelography (or excretion urography), and by its administration it is possible to obviate the risks of passing an opaque substance into the pelvis by means of the ureteral catheter in the diagnosis of kidney conditions. Further than this, by means of intravenous pyelography various pathological conditions of the kidneys and ureters can be determined in a way that is impossible by retrograde pyelography.

Abrodil is issued in substance in bottles of 20 gr. and also as a sterile solution in 40 per cent concentration ready for use. The administration is extremely simple and very seldom gives rise to any systemic upset. An excellent shadow has often been obtained as early as 2 minutes, and sometimes even 2 hours, after injection, depending on the functional activity of the kidneys. Usually the first exposure is made 5 minutes, and the second 15 minutes, after the intravenous injection. (Bayer Products Ltd., 19, St. Dunstan's Hill, E.C.3.)

**Acriflavine Emulsion (R. & B.).**—A permanent emulsion containing 1-1000 acriflavine in hydrocarbon oil base. This is a superior preparation to the aqueous solution, particularly for application after burns; also for ulcers and general antiseptic dressings. (Reynolds & Branson Ltd., 13, Briggate, Leeds.)

**Adrephine Suppositories** contain  $\frac{500}{1000}$  gr. of adrenalin and  $\frac{1}{2}$  gr. ephedrine in conjunction with  $\frac{1}{2}$  gr. of benzocain and  $\frac{1}{2}$  gr. of chlorotone. They are indicated in inflammatory and irritable conditions of the rectum, e.g., hemorrhoids, proctitis, pruritus, anal fissure, etc., being both astringent and analgesic. Supplied in boxes of 12 suppositories. (Parke, Davis & Co., 50-54, Beak Street, W.1.)

**Anotal.**—This is a new combination of phenylcinchoninic acid and ethylurethane for exhibition in rheumatism and allied conditions. Anotal is easily tolerated, and its administration is free from gastric disturbances and cardiac depression. Its analgesic action is rapid, and according to previous experience there is no reason to believe that it causes yellow atrophy of the liver. The dose is one or two tablets stirred in cold water, thrice daily. Not to be taken on an empty stomach. After treatment for ten to fourteen days there should be an interval of five to six days, and, on continuing, a period of three or four days' treatment should be followed by an interval of three to four days. (H. R. Napp Ltd., 3 & 4, Clements Inn, W.C.2.)

**Antipneumococcus Serum (Felton) Types I & II** is a solution of pneumococcal antibodies, concentrated, refined, and standardized according to Felton's method. Felton serum has proved successful in the treatment of lobar pneumonia due to the Types I and II diplococcus pneumoniae. Supplied in bulbs containing either 10,000 Felton units of each type (I and II) or 20,000 Felton units of each type. (Parke, Davis & Co., 50-54, Beak Street, W.1.)

**Barolac.**—This is the name given to a 30 per cent suspension of 'Wellcome' brand barium sulphate, a scientifically-prepared substance specially adapted to X-ray purposes. It is perfectly white in colour, is tasteless, odourless, and neutral, and possesses a satisfactory bulkiness. It is entirely free from soluble barium salts. This is of particular importance, as, owing to the large quantities in which this salt is employed, the presence of impurities, even in minute proportion, is extremely undesirable.

The 'Wellcome' brand barium sulphate contained in Barolac is in so finely divided a condition that no suspending agent such as tragacanth is necessary. The smoothness of the suspension, in conjunction with the absence of taste or smell, makes the addition of flavouring agents unnecessary, but if it is desired, vanilla, saccharin, or cocoa may be added. Barolac is issued in Winchester quarts by Burroughs Wellcome & Co., Snow Hill Buildings, E.C.1.

**Bi-liposol.**—Of the numerous preparations of bismuth introduced for the treatment of syphilis none appear to equal in therapeutic value the lipo-soluble bismuths, the importance of which was the subject of a communication to the Society of Dermatology and Syphilis, Paris, in 1928 by Prof. Levaditi and his collaborators. In this form bismuth possesses special and original properties, acting not only on visible lesions but producing complete sterilization of the organism. On injection there is a gradual dissociation of the metal from its oily solvent with regular progressive and complete absorption. Experimentally one of the most favoured oil-soluble salts employed was the campho-carbonate, and its superiority over the insoluble bismuth metal or insoluble salts has been definitely confirmed in clinical practice.

Bi-liposol contains bismuth campho-carbonate dissolved in ether-purified olive oil, equivalent to 4 cgrm. Bi per c.c. Its effect on primary lesions is extremely rapid—quite equal to the arsphenamines—and is equally efficacious in secondary symptoms. Dosage: 2 c.c. twice weekly by intramuscular injection for a series of 15 to 16 injections, a month's rest from treatment being allowed between each series. Supplied in ampoules of 2 c.c., boxes of 12, and in 25 c.c. rubber-capped bottles. (Modern Pharmaceuticals Ltd., London, W.C.1.)

**Bivatol** is basic bismuth  $\alpha$ -carboxethyl- $\beta$ -methylmonoate, a lipo-soluble bismuth which exhibits a far greater therapeutic activity than either of the insoluble salts or preparations of precipitated bismuth metal. It is a perfectly neutral body available in a lipid oily solution containing 4 cgrm. of bismuth metal per c.c.; painless on injection and does not produce nodes or cause any local reaction.

Exhaustive investigation and subsequent clinical experience has shown that bivatol is one of the most potent bismuth preparations yet introduced into the therapeutics of syphilis; it possesses an exceptional rapidity of curative action, an intensive serological action, and by progressive assimilation the patient is kept under the uninterrupted influence of the medicament.

General dosage: two injections of 2 c.c. weekly in courses of 12 injections, one month's rest being allowed between each course of treatment. Supplied in ampoules of 2 c.c., boxes of 12. (The Anglo-French Drug Co. Ltd., London, W.C.1.)

**Calcium with Vitamin D.**—This is a new collosol preparation containing 1 per cent (approx.) of a colloidal calcium salt of fatty acids standardized to contain 250 M.R.C. units per teaspoonful of vitamin D, in the form of irradiated ergosterol equivalent in Vitamin D to half a teaspoonful of the finest cod-liver oil.

Modern biochemical science has shown that utilization of calcium, when absorbed from the intestinal tract, is largely a function of vitamin D. Normally this accessory food factor is present in a well-balanced diet, and is frequently present in animal and vegetable oils. It is to this factor that cod-liver oil owes its antirachitic properties. Steenbock and others have shown that it can be produced artificially by irradiating ergosterol, and it is the latter which is added to this product to give it antirachitic properties.

Rats fed on a deficiency diet inducing rickets can be cured in a few days by the administration of Collosol Calcium with Vitamin D. It should be noted that the oral route is the natural method for administering vitamins, and, when given by injection, the same result would not be expected—a theory borne out by practice. Rachitic rats, when injected with vitamin D, are practically unaffected, whilst controls given the same doses orally are rapidly cured. (British Colloids Ltd., Park Royal, N.W.10).

**Campolon** is a new highly active liver preparation for intramuscular injection. Its efficacy is such that a daily dose of 2 c.c. has the therapeutic potency of 500 grm. of fresh liver. Introduced by Prof. Gänsslen, of Tübingen, campolon has now been employed for several months on the Continent, and has given very satisfactory results in pernicious anaemia and other conditions, including obstinate cases of secondary anaemia, sprue, convalescence, and lead and bismuth poisoning. The dosage is one ampoule of 2 c.c. daily, by intragluteal injection, for a period of 6 to 8 weeks. Campolon is issued in boxes of 5 ampoules of 2 c.c. each. (Bayer Products Ltd., 19, St. Dunstan's Hill, E.C.3.)

**Carotene.**—Burroughs Wellcome & Co. issue 'Tabloid' Carotene for clinical trial as a prophylactic and curative agent.

Carotene is a pigmented substance found in carrots, cabbage, tomatoes, butter, eggs, etc. It is an unsaturated hydrocarbon having the empirical formula  $C_{40}H_{56}$ , and may be obtained in pure crystalline form. It has been shown to possess in animal experiment the same growth-promoting and anti-infective actions as vitamin A.

Carotene is not itself identical with the uncoloured vitamin A found stored in animal livers, but is converted in the animal body into the slightly different leuco compound. Four milligrammes are approximately equivalent to the vitamin A contained in one teaspoonful of an average cod-liver oil. It is issued in bottles of 25 sugar-coated products, each of 0.002 grm.

**Cholate Compound Capsules.**—Containing glycocholate, taurocholate, salicylate and succinate of sodium, with papain and cascara. Prophylactic for gall-stones, and of great value for disinfection of inflamed biliary passages. It also aids excretion of nitrogenous waste matter. (Reynolds & Branson Ltd., 13, Briggate, Leeds.)

**Collosol 'F.C.V.D.'**—Pharmaceutical preparations of iron have long been used in the treatment of anemias. Comparatively large doses of these iron products were usually administered to obtain the desired effects. Frequently their use had to be abandoned owing to secondary effects on the digestive processes, constipation, head aches, and other undesirable symptoms.

In recent years the work of Hart, Steenbock, McHargue, Elvehjem, and others, suggested that the beneficial effect of the iron in the human organism was largely due to the presence of a small quantity of copper present as an impurity. They showed that copper was always stored in the organs particularly associated with haemoglobin metabolism.

As calcium deficiency is frequently associated with anemias and debility it has been considered advisable to make use of the well-established function of vitamin D in calcium absorption. As this accessory food factor has been added in the form of irradiated ergosterol combined in the medium of pure malt extract (vitamin B) with orange juice (itamin C), the nutritional advantages of Collosol 'F.C.V.D.' (Ferro-cuprum with Vitamin D in Malt Extract) will be readily appreciated. (British Colloids Ltd., Park Royal, N.W.10.)

**Collosol Iodine New Solution ('C.I.N.S.')**—This preparation provides a most important contribution to the therapeutics of pneumonia. In the *Irish Journal of Medical Science*, July, 1931, a clinician, Dr. R. V. Murphy, contributes a lengthy article on his experience with special 0.4 per cent and 0.8 per cent solutions of Collosol Iodine in the treatment of various forms of pneumonia. The contributor points out that the administration of the product produces earlier abatement of the toxæmia, and stresses the fact that the earlier the preparation is administered the less liability there is for complications.

The many case-charts which are associated with the article give an interesting and convincing picture of the possibilities of these concentrated solutions of Collosol Iodine, not only in the pneumonias, but in any other extreme toxic conditions, and there can be little doubt that the clinical trials carried out with these special solutions have opened up a new and important field for this established product. (British Colloids Ltd., Park Royal, N.W.10.)

**Dextrin-maltose, The 'Allenburys'**—A mixture of starch-free carbohydrates prepared by the malting of wheat. Highly suitable for infant feeding. Its constituents are among the most rapidly absorbed carbohydrates and entail the least risk of intestinal fermentation. It counteracts the tendency to diarrhoea sometimes produced by lactose. It helps to keep milk curd in fine, easily digestible flocculi. Four forms: No. 1 contains sodium chloride, 2 per cent, for infants generally; No. 2 is salt-free; No. 3 contains potassium bicarbonate, 3 per cent, for specially severe gastro-intestinal disorders; No. 4 contains vitamin D. Dosage varies widely with age, weight, and digestive powers. (Allen & Hanburys Ltd., Bethnal Green, E.2.)



**Diphtheria Prophylactic T.A.F.**—Diphtheria Prophylactic (Toxoid-Antitoxin Flocules) is prepared at The Wellcome Physiological Research Laboratories, Beckenham, Kent, and issued by Burroughs Wellcome & Co., Snow Hill Buildings, E.C., for producing active immunity to diphtheria. When toxoid and antitoxin are mixed, floccules are formed which retain the immunizing power of the toxoid. Removal of the supernatant liquid allows 99 per cent of the nitrogenous bodies present in the broth after growth of the bacilli to be discarded, with a resultant diminution of the tendency of the preparation to cause undesirable reactions. With the low liability to cause reactions 'Wellcome' brand Diphtheria Prophylactic T.A.F. shows unusually high immunizing power. It is issued in bottles of 1 c.c. and 10 c.c.

**Elityran** is a new thyroid preparation which has definite advantages over thyroidea siccata of the British Pharmacopoeia. The advantages of elityran are: (1) Ready solubility; (2) Exact standardization, enabling dosage to be gauged with precision; and (3) Absence of the usual by-effects of thyroid medication, such as cardiac palpitation and nervous upset. Extensive trial has shown that many cases that do not tolerate ordinary thyroid preparations may be given elityran without any unpleasant sequelae. Elityran is issued in tablets of 25 mgrm. each, in tubes of 30. (Bayer Products Ltd., 19, St. Dunstan's Hill, E.C.3.)

**Ephedrine Inhalant Compound** is a combination of ephedrine with menthol and camphor in an oily base for use as a nasal and laryngeal spray. It shrinks the nasal mucosa, thus relieving excessive excretion in rhinitis, coryza, etc. It forms a soothing and protective coating to inflamed mucous membrane. Supplied in 1-oz. bottles. (Parke, Davis & Co., 50-54, Beak Street, W.1.)

**Eucortone.**—An extract of suprarenal cortex (Swingle and Pfiffner) highly successful in the treatment of Addison's disease, both in the crises and in the more chronic phases. It is quite free from harmful impurities. Dosage: about 10 to 20 c.c. daily, by injection slowly in divided doses, usually increasing from 2 c.c. to not more than 5 c.c. at a time. Supplied in india-rubber-capped bottles of 25 c.c. (Allen & Hanburys Ltd., Bethnal Green, E.2.)

**Eulaxase.**—A combination of biliary and intestinal secretions with agar-agar and *Bacillus acidophilus*, in tablets with a special coating of activated charcoal. Designed for the treatment of constipation and its immediate results by natural methods. Dosage: 2 to 6 tablets thrice daily, after meals. (Allen & Hanburys Ltd., Bethnal Green, E.2.)

**Fiatal.**—This pluriglandular product is particularly applicable to conditions of female sexual dysfunction. It consists of desiccated fresh glandular extracts, including ovary and mammary, with calcium glycerophosphate and phosphate of iron. The dose is one or two tablets three times daily after meals. (H. R. Napp Ltd., 3 & 4, Clements Inn, W.C.2.)

**Hypotan** is a new vasodilator for oral administration, introduced to supplement the use of acecoline (acetylcholine hydrochloride) parenterally, and to take the place of the nitrites in relieving arterial spasms.

Each tablet contains 5 mgrm. of  $\alpha$ -methylacetylcholine bromide which, in combination with 5 mgrm. of bromocholine bromide, has a pronounced effect in relaxing peripheral spasms, this action being enhanced by the addition of 5 cgrm. of chloral hydrate in accordance with the well-known synergism existing between chloral and the bromides.

Indicated in all peripheral vascular affections, as a regulator of arterial deficiency or hypotensive agent, it is non-toxic, does not lose its effect after continued administration, nor cause untoward secondary effects. The dose is from 4 to 6 tablets daily; supplied in boxes containing 44 tablets. (The Anglo-French Drug Co. Ltd., London, W.C.1.)

**Hypotensyl** is a preparation in tablet form containing the active principles of mistletoe with hepatic and pancreatic extracts, for the treatment of conditions associated with high blood-pressure. The dose is from 3 to 6 tablets daily; supplied in bottles containing 50 tablets. (The Anglo-French Drug Co. Ltd., London, W.C.1.)

**Intestinal Streptococcus and B. Coli Vaccine** is prepared from strains of streptococci and *B. coli* responsible for infections of the gut or urinary tract. Issued in two strengths, the weaker containing 10 million streptococci and 25 million *B. coli* per c.c., whilst the stronger vaccine contains ten times the number of organisms per c.c. Supplied in ampoules of 1 c.c. and bottles of 10 c.c. and 25 c.c. (Parke, Davis & Co., 50-54, Beak Street, W.1.)

**I-so-gel Granules.**—Dried mucilage of certain tropical seeds, useful in both chronic constipation and diarrhoea. The granules absorb many times their own weight of water and swell into a gelatinous mass, which stimulates intestinal movements and soothes the intestinal mucous membrane. Suitable for diabetics. Dosage: Constipation—adults, two teaspoonfuls to two tablespoonfuls; children, half to one teaspoonful, once or twice daily, with water or other liquid. Diarrhoea—one to two teaspoonfuls, repeated frequently. (Allen & Hanburys Ltd., Bethnal Green, E.2.)

**Kaolin with Paraffin, The 'Allenburys'.**—A finely-dispersed emulsion of 'Osmo' (colloidal) kaolin, 20 per cent, and 'Chrismol' liquid paraffin, 33½ per cent, for chronic constipation with intestinal toxæmia, and for colitis, food-poisoning, etc. Dosage: adults, one or two tablespoonfuls; children, half to two teaspoonfuls, twice or thrice daily. (Allen & Hanburys Ltd., Bethnal Green, E.2.)

**Kapsol Calcium Compound (Vitamin).**—Soluble gelatin-coated capsules for the administration of calcium with its complementary vitamin D, as well as vitamin A. Specially indicated in pregnancy and lactation. Dosage. 2 or more daily. (Allen & Hanburys Ltd., Bethnal Green, E.2.)

**Kapsol Vitamin E (Wheat Germ Oil).**—Soluble gelatin-coated capsules containing the richest known source of the anti-sterility vitamin, for the treatment of sterility and habitual abortion. Dosage to prevent abortion: 5 daily for the first fortnight, and then at longer intervals, during pregnancy. (Allen & Hanburys Ltd., Bethnal Green, E.2.)

**Lacarnol 'muscle extract'** is a nucleosid extract prepared by a special process. A considerable amount of work has been done in the past few years on the Continent in the therapy of cardiac and circulatory disorders by extracts of mammalian tissues. Lacarnol represents the latest of one of the most efficacious of these, having an almost specific action in dilating the coronary arteries. It is therefore particularly indicated in angina pectoris and allied conditions. It can be administered both hypodermically and by the oral route, the latter having proved, according to the most recent investigations, equally efficacious. The dosage is 10 to 25 drops, 1 to 3 times daily, and this may be continued for many weeks.

Results have shown that in a few days after commencing this preparation the symptoms—attacks of radiating pains and the sensations of oppression, dyspnoea, and impending death—were markedly ameliorated, and in most cases disappeared entirely. Further, in less striking cases, where the attacks could not be completely abolished, lacarnol therapy was almost invariably superior to any other previously tried.

The exact chemical nature of the active principle present has not yet been fully determined, but the bulk of evidence available would seem to indicate that it is an intermediate metabolic product of nuclear protoplasm. Lacarnol is issued in drop-bottles of 20 c.c., and in ampoules of 1 c.c. in boxes of 5, for parenteral administration. (Bayer Products Ltd., 19, St. Dunstan's Hill, E.C.3.)

**Leucagine** is a bactericidal and radio-active preparation, in the form of soluble bougies and ovules, for the treatment of acute and chronic uterine infections. The bougies are supplied, lubricated ready for use, in sterile glass tubes, and their firm but flexible consistency renders them particularly adaptable for uterine catheterization. Each bougie contains 10 cgrm. of an organic silver salt (20 per cent Ag) and radium bromide of maximum activity in concentrations of 1, 3, 5, and 10 microgrammes, the 1 and 3 micros being suitable for cases of metritis of mild and medium severity, the 5 micro for cases of severe lesions, and the 10 micro for cases of hæmorrhagic metritis. The action of the bougies can be usefully enhanced by employing leucagine ovules in the intervals between uterine applications. The ovules contain an association of tannin, organic silver, uric acid, and radium bromide (¼ micro each), and in all cases of vaginal infection they have an ameliorating and curative action. Dosage: One bougie or 1 ovule every second or third day. (The Anglo-French Drug. Co. Ltd., London, W.C.1.)

**Lixen Elixir and Lixen Laxative Lozenges.**—Preparations of a special, non-gripping, extract of senna. The lozenges resemble sweets, and appeal strongly to children. Dosage: Elixir—adults, half to one teaspoonful; children, 15 drops or more. Lozenges—adults, one to two; children, half to one. (Allen & Hanburys Ltd., Bethnal Green, E.2.)

**Lomolo.**—A harmless, non-greasy and non-poisonous contraceptive. *In situ*, the rapid disintegration of the tablet produces a voluminous foam, powerfully spermicidal and antiseptic, and leaves no caustic residue. It has been shown by independent tests that Lomolo exercises a surface-tension action on the vaginal wall and ensures that the foam reaches the whole of the membrane. One tablet to be inserted in the vagina two or three minutes before each occasion. (H. R. Napp Ltd., 3 & 4, Clements Inn, W.C.2.)

**Multibral.**—This sodium momobromoleate is a new chemical body, possessing an effective action twenty times as great as that of bromide combinations. Presented in the form of coated pellets, each containing 0.03 grm. of bromine. Indicated in all conditions in which bromides are prescribed. The dose is one to three tablets three times daily. (H. R. Napp Ltd., 3 & 4, Clements Inn, W.C.2.)

**Mycozol.**—An ointment containing chlorethone, salicylic acid, and mercury salicylate, with aromatics, in a bland penetrating base. Indicated in the treatment of various fungous infections of the feet, hands, and hairless skin, generally classed as epidermomycosis, sometimes referred to as 'athlete's foot', 'swimmer's itch', 'dhubie itch', etc. Supplied in 1-oz. collapsible tubes and 1-lb. containers. (Parke, Davis & Co., 50-54, Beak Street, W.1.)

**Neotropin.**—After a greater delay than was anticipated when we wrote of this preparation in our 1931 edition, Neotropin has now been placed on the market, and already considerable success has attended its use.

A fundamental factor of its effectiveness is the marked power of penetration which it displays. This, together with its bactericidal properties, renders it strikingly effective in all infective conditions of the genito-urinary tract, and as a pre-operation antiseptic. It has also been used with excellent results in retention and in gonorrhoeal complications.

As a rule, a dose of two dragées three times a day is sufficient; literature giving full details may be obtained from Schering Ltd., 3, Lloyd's Avenue, E.C.3.

**Novalgin** is a pyrazolon derivative which has marked advantages over the salicylates in the treatment of rheumatism, being well tolerated and applicable by the subcutaneous as well as by the oral route. (Bayer Products Ltd., 19, St. Dunstan's Hill, E.C.3.)

**Ouabain.**—This is a crystalline glucoside extracted from the seeds of *Strophanthus gratus*, prepared by Burroughs Wellcome & Co. at the Wellcome Chemical Works and issued as 'Wellcome' brand Ouabain in tubes of 0.5 grm.

Ouabain, known as strophanthin-g, crystallizes readily, and its purity is easily determined by chemical analysis, thus rendering direct biological tests for potency unnecessary. For this reason Ouabain is taken as a standard of reference in the bio-assay of cardiotonic drugs. It is the official strophanthin of the German Pharmacopœia and is the standard for all medicaments used in cardiology in the United States Pharmacopœia.

Clinically, ouabain is superior to amorphous strophanthin because of its ready solubility, and, being a pure crystalline substance, it is not subject to variation in composition as is amorphous strophanthin.

**Padutin** (Kallikrein 'Bayer'), according to Frey and Kraut, is a circulatory hormone, presumed to be formed in the pancreas. Its action is to dilate the peripheral arteries and arterioles, and it is therefore indicated in conditions such as intermittent claudication, threatened gangrene, Raynaud's disease, varicose ulcers, and so forth, where it promotes nourishment of the tissues by increasing the blood supply. It is also effective in reducing high blood-pressure. Padutin is administered intramuscularly in a dosage of half an ampoule (1 unit) twice a day for about three days, then increasing to one ampoule (2 units) twice a day. This dosage scheme may be continued for 10 to 14 days, and if improvement is not manifest by that time, it may be increased to two ampoules twice a day. Padutin for parenteral administration is issued in ampoules of 1 c.c., each containing 2 units per c.c., in boxes of 5 ampoules. Padutin may also be given by mouth, for which purpose it is issued in bottles of 10 c.c., each c.c. containing 3 units; the dosage by mouth is 10 drops three times a day. (Bayer Products Ltd., 19, St. Dunstan's Hill, E.C.3.)

**Panteric Compound Tablets** contain 4 gr. of triple-strength pancreatin, together with  $\frac{1}{2}$  gr. each sodium glycocholate and sodium taurocholate. The pancreatic enzymes are thus reinforced by the bile salts, which, in view of their close association in the body, is a logical combination. These tablets are coated with the same enteric coating as panteric tablets and are thus unaffected by the acid of the gastric secretion. Supplied in bottles of 100 and 500. (Parke, Davis & Co., 50-54, Beak Street, W.1.)

**Percainal.**—This ointment contains 1 per cent of percaine combined with ingredients possessing antipruritic, antiphlogistic, and astringent properties. The ointment produces reliable and prolonged analgesia, and consequently its use is indicated in the treatment of all painful conditions of the skin and mucous membrane, such as eczema, macerations of the skin, bed-sores, herpes zoster, chaps, cracked nipples, ulcers cruris, ulcers due to X rays, intertrigo, pruritus ani et vulvæ, anal fissures, hæmorrhoids, burns, etc. It is available in collapsible tubes containing 40 grm. (The Clayton Aniline Company Ltd., 40, Southwark Street, S.E.1.)

**Percaine 2 % Isotonic Solution.**—This solution is intended exclusively for surface anaesthesia of mucous membranes in oto-rhino-laryngological and dental practice. It may be applied as a paint, as a spray, or by dabbing, and is available in stoppered bottles containing 30 c.c.

In the *Brit. Med. Jour.*, Nov. 28, 1931, in an article on the pharmacology of percaine, from the Department of Pharmacology, University of Manchester, the authors state that for local application to mucous membranes, percaine is quite the most efficient local anaesthetic so far investigated. They remark further that percaine is a most promising addition to the surgeon's pharmacopoeia and may well pave the way to the abandonment of cocaine. (The Clayton Aniline Company Ltd., 40, Southwark Street, S.E.1.)

**Prolan** is a hormone obtained from the anterior lobe of the pituitary and is indicated in conditions of dysfunction or mal-development of the internal genital organs. (Bayer Products Ltd., 19, St. Dunstan's Hill, E.C.3.)

**Raminal.**—This product is a combination of theobromine calcium salicylate with ferri phos. and chlorophyll. It is intended for exhibition in conditions of hyperpiesis, arterio-sclerosis, angina pectoris, and the retrogressive changes of senescence, in which satisfactory results have been recorded by observers. The dose is two tablets, three times daily before meals. (H. R. Napp Ltd., 3 & 4, Clements Inn, W.C.2.)

**Rethragine** is a radio-active and bactericidal preparation, containing an organic salt of silver, uric acid, and radium bromide, for the treatment of acute and chronic urethral infections. Indicated particularly in gonococcal infections, and in acute and chronic urethritis, it not only exhibits a marked efficacy in the urethral infection but favourably influences infection of adjacent glands. Rethragine is supplied in the form of bougies (Rethragine 'M' for males in 2 concentrations, 1 micro and 2 micro; Rethragine 'F' for females, 1 micro), which are prepared under strict aseptic conditions, and issued, lubricated for use, in sealed sterile glass tubes; the bougies are entirely soluble, and, being supple, they can be readily introduced into the urethral canal. Dosage: 1 bougie inserted every 2 or 3 days. (The Anglo-French Drug Co. Ltd., London, W.C.1.)

**Semboi.**—A well-balanced combination of pluriglandular extracts with calcium glycono-phosphate and phosphate of iron. It is particularly indicated in dysfunction of the male organism. The dose is one or two tablets three times daily, after meals. (H. R. Napp Ltd., 3 & 4, Clements Inn, W.C. 2.)

**Sodium Morrhuate.**—'Hypoid' sodium morrhuate is now available as a sclerosing agent for the treatment of varicose veins. It is claimed that sodium morrhuate has distinct advantages over other sclerosing agents. It is stated to be innocuous to the subcutaneous tissues, thus reducing to a minimum the risk of an 'injection ulcer'.

A total dosage of up to 10 c.c. of a 10 per cent solution may be given at one sitting, but in practice such large quantities are not often required. A 5 per cent solution is usually quite strong enough and the use of the 10 per cent solution is necessary only in those cases in which the weaker solution has failed to cause sufficient reaction. In most cases  $\frac{1}{2}$  c.c. to 1 c.c. of a 5 per cent solution is injected at each puncture, the length of vein treated at one time depending upon its size and the condition of the patient. With correct dosage and spacing of punctures, periphlebitis is stated to be rare and obliteration of the vein is obtained with the minimum of pain and discomfort.

'Hypoid' sodium morrhuate is issued in 5 per cent and 10 per cent solution in boxes of 5 hermetically-sealed phials of 2 c.c. each, and also in bottles of 25 c.c., by Burroughs Wellcome & Co., Snow Hill Buildings, E.C.1.

**Somnosol.**—This product consists of alpha bromiso-valerianyl urea (5 gr.) with dimethyl-amido-phenyldimethyl-iso-pyrazolon ( $2\frac{1}{2}$  gr.). Exhaustive clinical observations have affirmed its utility as a non-toxic sedative, analgesic, and soporific. Somnosol is rapid in action, and its administration is unaccompanied by secondary sequelae. As a sedative, one or two tablets are given three times daily with cold fluid. As a soporific two tablets with hot fluid. (H. R. Napp Ltd., 3 & 4, Clements Inn, W.C.2.)

**Staphylococcus Vaccine**, prepared from cocci isolated from malignant tumours. Used in the treatment of inoperable cancer it frequently relieves pain and improves the patient's general condition. It may also be used to prepare the way for operation by reducing the size of the tumour. The vaccine is supplied in 1 c.c. ampoules and bottles of 10 c.c. and 25 c.c., each 1 c.c. containing 100 million organisms. (Parke, Davis & Co., 50-54, Beak Street, W.1.)

**Tetanol (Calcium Levulinate).**—The clinical syndrome of tetany, no matter from what cause the condition arises, can be explained almost solely on the grounds of a diminished blood-calcium content. The administration of calcium, particularly by intravenous or intramuscular injection, rapidly relieves the acute symptoms of the disease.

Tetanol, the calcium salt of levulinic acid, contains a higher percentage of calcium (13 %) than the gluconate (9 %), and solutions containing as much as 25 % of the salt (3.25 % actual calcium) can be given with impunity by intramuscular injection. Although clinically active, tetanol appears to be free from any toxic effect even when administered intravenously. (British Colloids Ltd., Park Royal, N.W.10.)

**Theelin** is the ovarian follicular hormone isolated in crystalline form by Dr. E. A. Doisy, of St. Louis University. It is issued in ampoules for hypodermic injection. Theelin is physiologically assayed and each c.c. of the solution contains 50 Doisy rat-units. It is also supplied in vaginal suppositories (pessaries). Theelin is indicated in disturbances of uterine and ovarian function, sexual frigidity, and in the various symptoms associated with the menopause. (Parke, Davis & Co., 50-54, Beak Street, W.1.)

**Tuberculin for the Mantoux Test.**—The intracutaneous injection of diluted old tuberculin, according to the method of Mantoux, has been generally accepted as a reliable and delicate test. Each package contains two 10 c.c. vials, one containing 0.01 c.c. of old tuberculin and the other 10 c.c. of diluent, producing sufficient material for 100 tests. (Parke, Davis & Co., 50-54, Beak Street, W.1.)

**Ulcerative Colitis Antistreptococcus Serum** is prepared from the serum of horses immunized after a method described by Dr. H. A. Barger with live cultures of a non-hæmolytic streptococcus isolated from the lesions of patients suffering from uncomplicated chronic ulcerative colitis. The serum is specific for colitis caused by the particular type of organism used in its production and which is considered by Barger and others to be of etiological significance in chronic ulcerative colitis. Supplied in rubber-capped bottles of 20 c.c. (Parke, Davis & Co., 50-54, Beak Street, W.1.)

**Unden** is a standardized ovarian hormone indicated in substitution therapy of hypofunction of the ovary and in disturbances of the climacterium. (Bayer Products Ltd., 19, St. Dunstan's Hill, E.C.3.)

**Uroselectan B** is a di-sodium salt of di-iodo-pyridoxyl-N-methyl-dicarboxylic acid: a contrast agent for the radiographic visualization of the kidneys and urinary tract by intravenous injection, which makes it possible to obtain pyelograms showing all details necessary for diagnosis by the injection of the contents of a 20 c.c. ampoule. This is a great advance over previous preparations, since the injection of a large quantity of fluid is no longer necessary.

Uroselectan B is supplied in ampoules, sterilized ready for use, containing 15 gm. of the substance dissolved in a 20 c.c. solution of invert sugar. The ampoule is warmed to body temperature and the contents injected slowly with an ordinary 20 c.c. syringe. (Schering Ltd., 3, Lloyd's Avenue, E.C.3.)

**Ventriculin with Iron** presents this potent extract of gastric tissue in conjunction with a scale preparation of iron, such a combination having been shown to be superior to either preparation alone for the treatment of secondary anaemia. Supplied in aluminium-capped bottles of 100 gm., the cap forming a measure for the dose. (Parke, Davis & Co., 50-54, Beak Street, W.1.)

**Vitamin Glucose C.D., 'Torch' Brand.**—Pure powdered medicinal glucose containing a prophylactic complement of the anti-scorbutic vitamin C (orange juice) and the anti-rachitic vitamin D (irradiated ergosterol). Dosage: children, about a dessert-spoonful twice daily; adults, about a tablespoonful twice or thrice daily. (Allen & Hanburys Ltd., Bethnal Green, E.2.)

**Xorox.**—A new and powerful hæm tonic, combining liver, stomach, and spleen substances, with anterior pituitary, in the form of oral tablets. It has been shown to exercise a rapid and marked effect in conditions of blood impoverishment, and is particularly indicated in anæmias (primary and secondary) and in post-febrile debility. The dose for adults is two tablets three times daily. Children: 1 year,  $\frac{1}{2}$  tablet daily; 2 to 4 years, 1 tablet daily; 5 to 10 years, 1 tablet twice daily; 11 to 16 years, 1 tablet thrice daily. (H. R. Napp Ltd., 3 & 4, Clements Inn, W.C.2.)

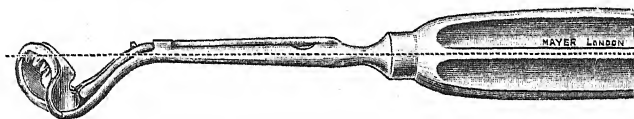
**Zoin.**—This is a new amino-acid-phosphorus compound of animal origin. Recent researches carried out by S. and T. Posternak on the phospho-proteins of milk casein and the vitellin in the eggs of birds and fishes have led to the discovery of interesting amino-phosphorus compounds. In these the phosphorus is combined with *levo-serin* as a phosphoric ester. These amino-phosphorus compounds play an important part in the formation of the cell-nucleus and the development of the young organism and the embryo.

Zoin is a water-soluble salt of a complex amino-phosphorus body occurring in milk casein. It contains more than 5 % of organic phosphorus and is a white powder of agreeable and slightly acid flavour. Pharmacological tests have shown that it is almost completely innocuous both when given by the mouth and when administered subcutaneously. In man, doses of 2 grm. daily have been taken over a long period without untoward symptoms resulting.

Zoin is indicated in all cases requiring phosphorus therapy, such as exhaustion states during and after infectious diseases, disorders of metabolism and of growth, anæmia, chlorosis, functional neuroses, neurasthenia, and during pregnancy and lactation. It is supplied in bottles containing 30 tablets of 4 gr. It is also available in liquid form in bottles of 30 c.c. (The Clayton Aniline Company Ltd., 40, Southwark Street, S.E.1.)

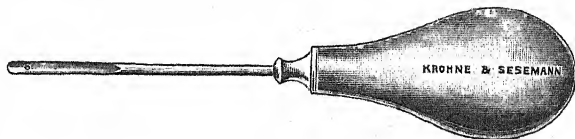
## MEDICAL AND SURGICAL APPLIANCES

**Adenoid Curette.**—Mr. O. O. Popper has modified the StClair Thomson curette by having the cutting edge in direct continuity with the axis of the handle. In order to clear the soft palate, that part of the instrument between the head and the handle is curved downwards (*Fig. 125*). This curette cannot rotate about any point other than the edge of the blade. The instrument will guide itself down the post-nasal wall, and will adapt itself automatically to the varying curvatures of the different post-nasal



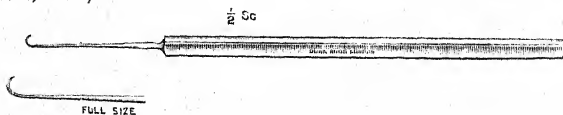
*Fig. 125.*

spaces. All that is necessary is to apply moderate pressure throughout the sweeping-down movement. Whatever the position of the instrument the blade is always at the cutting angle. The drawback to the standard curette is that it does not retain its keen cutting edge; with this pattern the blades are easily replaced at a small cost. This instrument is made both by Allen & Hanburys Ltd., 48, Wigmore Street, W.1, and Mayer & Phelps, 59-61, New Cavendish Street, W.1.



*Fig. 126.*

**Bone Awl.**—We illustrate here a new bone awl (*Fig. 126*) which has a groove each side, and an eye. Made in two sizes for Mr. A. S. B. Bankart. (Krone & Sesemann, 37, Duke Street, W.1.)



*Fig. 127.*

**Brain Tissue Hook.**—For Mr. Hugh Cairns, Surgeon at the London Hospital, Down Bros. Ltd., of London, have made a fine hook (*Fig. 127*) for picking up tissues in brain operations. Details are shown in the illustration.

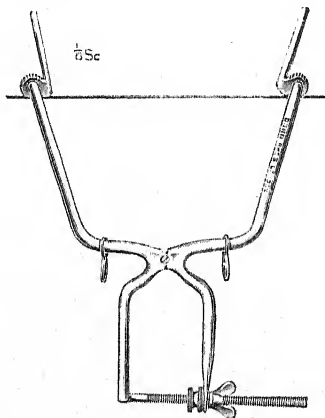
**Breast Pump ('The Toronto').**—This pump (*Fig. 128*), as used in the Obstetrical Unit, University College Hospital, London, possesses many advantages over the older patterns. It is more hygienic, as the rubber part can be detached and the glass part sterilized by boiling, as the Pyrex glass is strong and resistant to heat.

It is more comfortable for the mother—the glass fits snugly and the hand rests in the lap when pumping and causes less fatigue. Its capacity—3 to 4 oz.—renders it unnecessary to be frequently emptied, consequently the rim does not get wet and the glass is more easily kept in position. Milk cannot get into the rubber portions of the apparatus owing to the shape of the glass vessel and its vertical position during use. (Mayer & Phelps, 59-61, New Cavendish Street, London, W.1.)



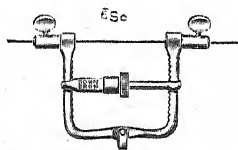
*Fig. 128.*

**Calipers and Drills for Kirschner Wires.**—Mr. W. H. Ogilvie, of Guy's Hospital, has recently described the use of Sven Johansson's drills and calipers for the insertion of Kirschner's wires.

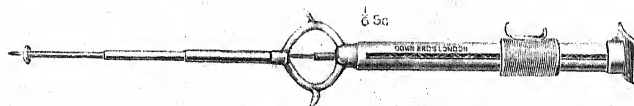


*Fig. 129.*

The drill (*Fig. 129*) has a double archimedean action so that the backward and forward movement of the collar on the handle will drive the wire rapidly in a clockwise direction.



*Fig. 130.*



*Fig. 131.*

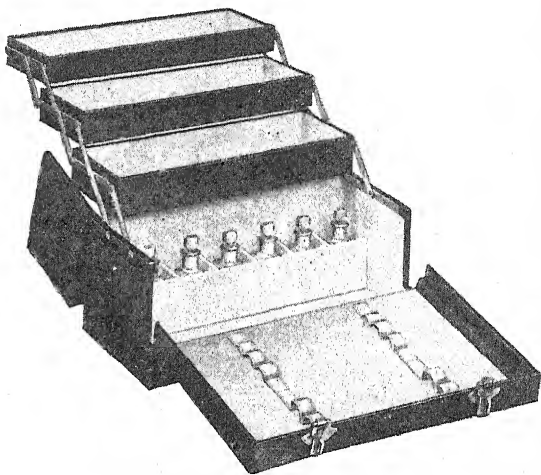
The extension clamp (*Fig. 130*) has a can lock for the wires on each arm, and the wire tightening mechanism is effected by spreading the arms of the caliper. A smaller caliper (*Fig. 131*), is made for traction in the upper limb.

The makers in this country are Messrs. Down Bros. Ltd., St. Thomas's Street, London, S.E.

**Carbon-dioxide Apparatus.**—We illustrate (*Fig. 11*, page 62) a portable apparatus suggested by Dr. A. F. Hurst, of The New Lodge Clinic, Windsor, for the relief of hay fever, asthma, and vasomotor rhinitis.

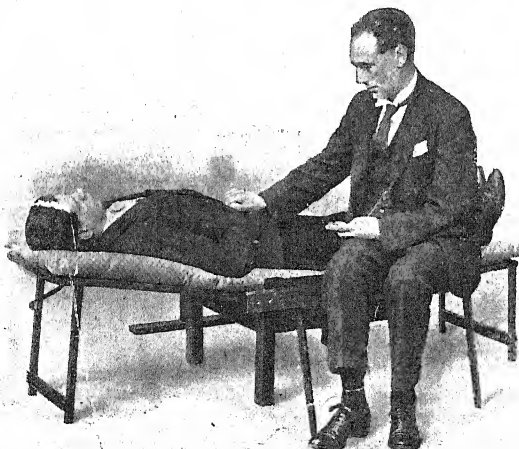
In cases of vasomotor rhinitis the treatment should be given for five minutes up each nostril every morning. In hay fever this should be done throughout the hay-fever season, and, in addition, the gas should be used as often as necessary during the day immediately an attack threatens to begin, and continued until it passes off. For paroxysmal sneezing and nose-running the treatment should also be given immediately an attack begins. In cases of asthma which begin with an attack of this kind, the gas may prevent it from developing. (A. Charles King Ltd., 34, Devonshire Street, W.1.)

**Case for Instruments, Etc.**—This new leather case, with three trays (*Fig. 132*) which can be opened out instantly, giving access to every part, is made in cow-hide, either brown or black, and is fitted with divisions to hold six bottles. The fall front is provided with loops for instruments, and the whole of the interior is washable. The measurements when closed are  $16\frac{1}{2}$  in. long  $\times$   $6\frac{1}{2}$  in. wide  $\times$   $12\frac{1}{4}$  in. deep; with handle for carrying at top. (Reynolds & Branson Ltd., 12-13, Briggate, Leeds.)



*Fig. 132.*

**Chair and Consulting Room Couch.**—It has been observed whilst undertaking locum tenencies in many parts of the country that a large number of general practitioners do not possess a satisfactory examination couch. To supply this want Dr. John Ewing has designed the combined examination, operation, and invalid couch (*Fig. 133*), which can be transformed into an ordinary lounge chair.



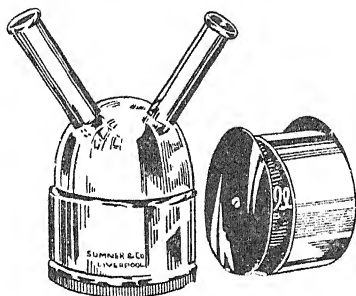
*Fig. 133.*

The framework is of solid oak and it is supplied with one two-fold and one single well-padded cushion. If necessary, it may be had in mahogany at an additional cost.

The price complete is £7 7s. A fully illustrated description may be obtained from Reynolds & Branson Ltd., 12-13, Briggate, Leeds.



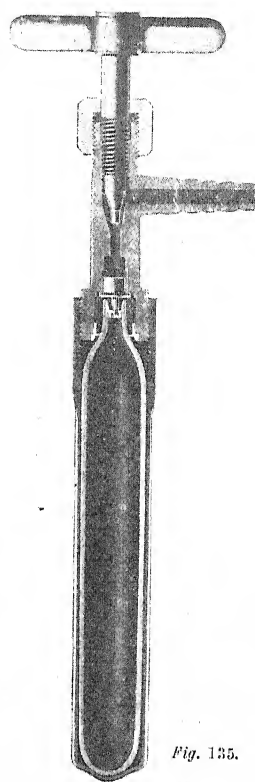
**Chest-piece (O'Sullivan's).**—This is a new type of chest-piece (*Fig. 134*) having two vulcanite diaphragms connected by a spring. It gives excellent results without any distortion. Heart murmurs and adventitious sounds in



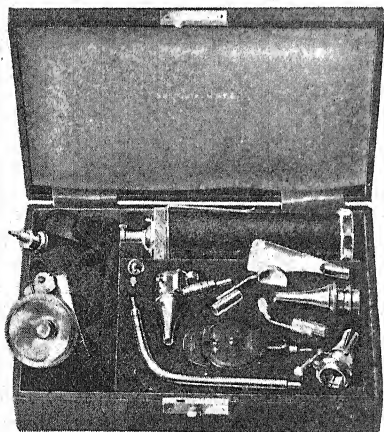
*Fig. 134.*

lungs are very much intensified by the use of the double vulcanite discs. Price 11s. 6d. net. (R. Sumner & Co. Ltd., 40, Hanover Street, Liverpool.)

**CO<sub>2</sub> Apparatus (Portable).**—A simple, effective, and convenient adjunct to the practitioner's midwifery and anæsthetic bag is the portable apparatus for the therapeutic administration of CO<sub>2</sub>, manufactured by Sparklots Ltd., Upper Edmonton, N.18, and here illustrated (*Fig. 135*). It consists of a metal holder carrying a 6-in. cylinder of gas. The valve apparatus is screwed down into the holder, the mouth of the gas cylinder being pierced in the process by a needle. The flow of gas thus released is controlled by the fine-adjustment valve key at one end of the apparatus and delivered through a rubber tube leading off from the outflow pipe. The tube can be attached underneath an ordinary Schimmelbusch mask placed in the patient's mouth, connected to a glass funnel or to a rubber catheter inserted into the naso-pharynx. The valve key gives a delicately regulated stream of gas, but, if need be, a small rubber bladder can be incorporated in the delivery tube so as to ensure an even flow.



*Fig. 135.*



*Fig. 136.*

Each cylinder produces about 12 litres of the gas, and, at the maximum rate of flow, will last for at least six minutes. Refill cylinders, of which six are supplied, can be inserted easily and with loss of very little time.

The apparatus is neither cumbersome nor heavy, being only 10 in. long and weighing a trifle over 1½ lb. As a readily available source of respiratory stimulant, this CO<sub>2</sub> 'resuscitator' is to be recommended. It can be obtained from Chas. F. Thackray, Park Street, Leeds, and 252, Regent Street, London.

**Diagnostic Set.**—This new British-made Diagnostic Set (*Fig. 136*) includes an improved May electric ophthalmoscope, daylight electric auriscope, expanding nasal speculum, curved rod complete with boillable mirrors, tongue spatula, and in addition is fitted with a powerful focusing and swivelling headlamp mounted on a

very light headband designed to work off the same battery handle. A special new battery handle has been designed for the purpose, having many advantages over the old type—it has twice the capacity of the usual handle, and is fitted with an efficient rheostat, and a clip (fountain-pen style) so that it may be clipped to the breast pocket when in use with the headlamp, leaving both hands free. This is a great advantage for use in obstetrical work, perineal suture, etc.

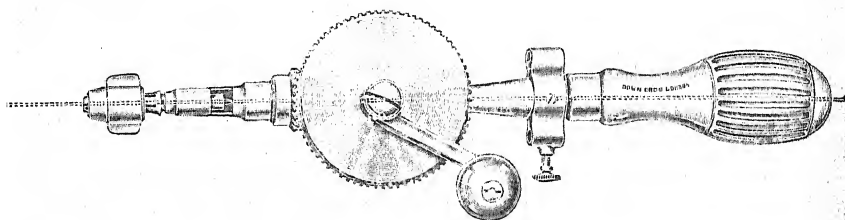
An electric expanding vaginascoper and rectoscope can be supplied when required.

The makers are John Smith & Son (Glas.) Ltd., 28, Gibson Street, Hillhead, Glasgow, W.2.

**Drill for Kirschner Wires**—Mr. H. S. Souttar, C.B.E., has devised a new form of drill (*Fig. 137*) for inserting Kirschner wires. For this drill the following advantages are claimed:—

High speed, owing to the 4 : 1 ratio of the small wheels on the drill.

The chuck which takes the Kirschner wires is removable, and the drill stock can be used for all standard forms of tools usually supplied with Albee's or Ogilvie's bone operative sets.



*Fig. 137.*

The drill stock is perforated for its entire length, therefore a Kirschner wire can be passed through it. Where the surgeon does not care to employ this method, a Souttar telescoping attachment can be added. This telescoping attachment is made as an individual unit and can be attached to Albee's and Ogilvie's outfits if desired, or to the small Souttar's universal motor.

Instead of using the usual Kirschner stirrup, Mr. Souttar has devised a ring to hold the Kirschner wire, which serves a double function—that of suspending the limb in addition to the usual traction. The makers are Down Bros. Ltd., St. Thomas's Street, London, S.E.

**Face Mask.**—Mr. H. E. Collier, of Redditch, has designed a form of light aseptic mask (*Fig. 138*) which has been submitted to Dr. Leonard Colebrook of the inoculation department of St. Mary's Hospital, to Professor Miles Phillips of Sheffield, and to Professor Beekwith Whitehouse of Birmingham. As the result of their advice and criticism the present mask is made for general use.



*Fig. 138.*

It consists of a piece of jaconet applied to a strip of flexible aluminium, to the ends of which tapes are attached, which are tied round the back of the head. The strip is moulded by the wearer to the shape of his nose and face. To the lower part of the jaconet is attached a light, open, metal neckspring, which serves to prevent the mask from flapping forward when the wearer bends forward. The mask can be sterilized by simple washing in a strong antiseptic solution. It is germ-proof, does not fog the glasses, can be worn in any place, and is reasonably comfortable to wear. Its use by doctors and midwives would materially lessen the incidence of puerperal sepsis.

The makers are Down Bros. Ltd., St. Thomas's Street, London, S.E.

## FORCEPS.

**Adenoid Forceps.**—These forceps (*Fig. 139*) are made by Mayer & Phelps, of London, for Dr. George Cathcart, and are intended to remove the smaller masses in the Rosenmüller fossæ which cannot be removed by the curette. It is, in his opinion, these smaller

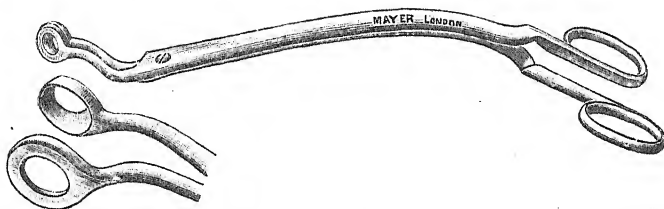


Fig. 139.

masses that cause the inflammation which spreads up the Eustachian tubes, thus leading to catarrhal deafness.

These forceps have sharp cutting or punch blades and are guided into position by the finger of the left hand. Two sizes are made, the larger for the central mass, and the smaller can get into the fossæ of Rosenmüller quite easily.

**Angular Suture-holding Forceps.**—The continuous suture, rare on the continent but almost universal in Britain, requires that the material shall be held taut after each stitch, to prevent slack developing in the suture line. In most surgical operations this

is best done by the hands of the assistant. In bone and joint surgery, where no-touch methods are an essential part of good technique, this is not permissible, and the surgeon must either use interrupted stitches, or employ some form of suture-holding forceps. The usual patterns have metal jaws which, though smooth, weaken the suture material considerably where they grip it, so that it may break at the time or afterwards, allowing the whole length of the suture line to gape. This accident is very liable to happen with the fine 00 catgut usually employed for tendon suture, for approximating the synovial membrane and capsule of a joint, or for closing the soft tissues over a bone. Down Bros. Ltd., of London, have made for Mr. W. H. Ogilvie a pair of suture-holding forceps (*Fig. 140*) whose general design is that of the familiar Guy's pattern, but whose blades end in a rounded loop open at one end, over which is slipped a length of fine rubber tubing. The rubber gives a secure grip, but cannot injure the finest gut; it can, of course, be renewed when worn.

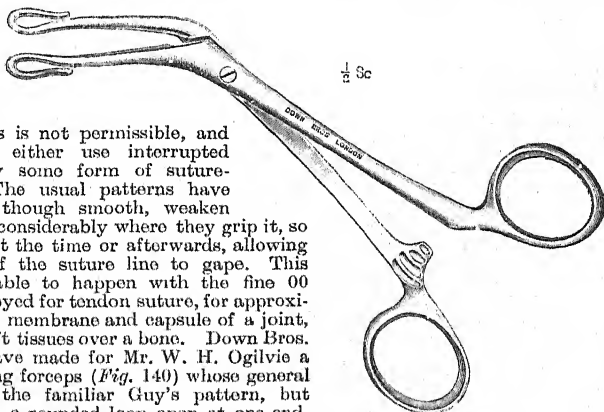


Fig. 140.

**Artery Forceps.**—We illustrate here a form of light artery forceps (*Fig. 141*) for use

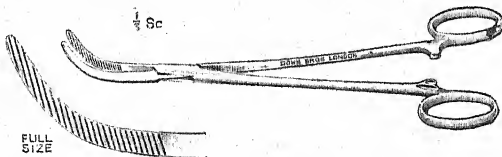


Fig. 141.

in tonsil operations, devised by Mr. L. D. Mercer, of Manchester, and made by Down Bros. Ltd., St. Thomas's Street, London, S.E.

**Artery Forceps.**—Mr. Harold Dodd (London) writes: The average artery forceps is usually straight, and will not clip 'round a corner'. The jaws are transversely serrated, and when a little worn will not surely grip a ligature; also, when applied to a width of appendicular mesentery, omentum, broad ligament, or hernial sac, they frequently allow the tissue held by the middle of the jaws to slip out, and time is consumed in correcting the error. The handles lend themselves readily to entangling loops of suture material and other artery forceps then in use, either round the neck of the rings or between the rings. The Glendenning ratchet only partially overcomes this.

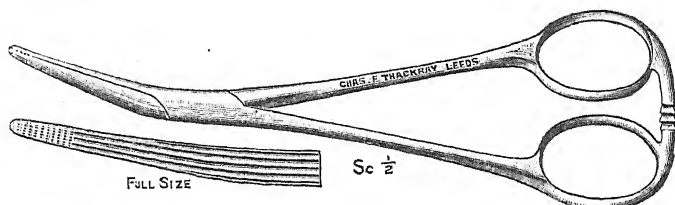


Fig. 142.

The forceps illustrated (Fig. 142) are of robust, but not heavy, construction; box-jointed, well balanced, with large, thin, easily accessible handle rings, and a stout end-placed ratchet; this latter adds power to the jaws and elasticity or 'whip' to the handles, permitting easy release by the left hand. The jaws are medium-pointed and angled. The serrations are transverse at the tips and deeply longitudinal in the remainder of their length; this successfully holds ligatures, omentum, etc. The stream-lined handles and Glendenning ratchets are effective in preventing loops of suture and other instruments from becoming entangled. (Chas. F. Thackray, Park Street, Leeds, and 252, Regent Street, London.)

**Bone-holding Forceps.**—For the surgeons at the Sheffield Royal Infirmary Messrs. Down Bros., of London, have recently made a small type of bone-holding forceps (Fig. 143) for grasping such bones as the ulna or tarsus. It is  $9\frac{1}{2}$  in. long and the width



Fig. 143.

between the jaws is so carefully calculated that there is no fear of the assistant—to whom it is given to handle—exercising undue pressure and crushing the bone.

**Michel and Kifa Clips Insertion Forceps.**—These forceps (shown here  $\frac{1}{2}$  scale—Figs. 144, 145) were designed by Mr. L. Dougal Callander for the insertion of Michel clips and particularly the Kifa suture clips. The teeth of the holding forceps (Fig. 144) are after Childe's pattern, thus facilitating the approximation of the edges

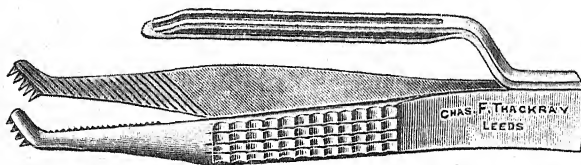
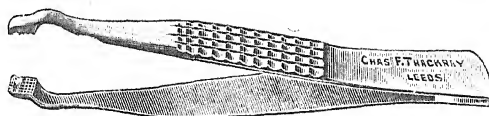


Fig. 144.

of the wound. The roughened areas on both the clip holder and the insertion forceps help the surgeon to obtain a secure grip on the skin edges, and to apply firmly to the skin whichever clip is used.

The gallery which holds the clips is the exact width of the Michel clip, is easy to load, and the strength of the spring, whilst enabling the clips to be easily removed, prevents them falling off or overriding each other, as frequently occurs.

The suture forceps (*Fig. 145*) inserts both varieties of clips easily, and removes the Kifa clips as readily, without pain to the patient. The several widths of Kifa clips

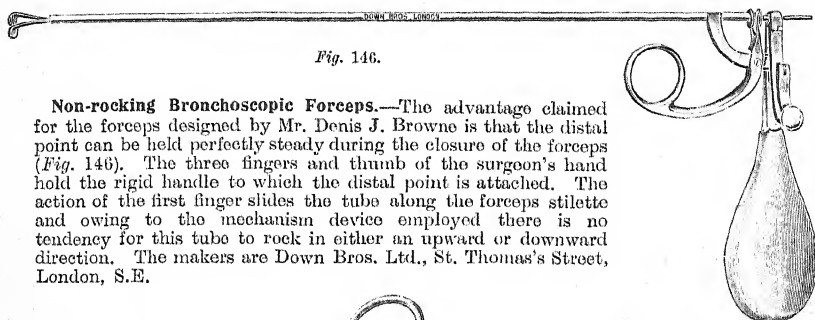


*Fig. 145.*

available particularly facilitate the closure of many upper abdominal and other wounds where Michel clips tend to slip owing to the thickness of the skin.

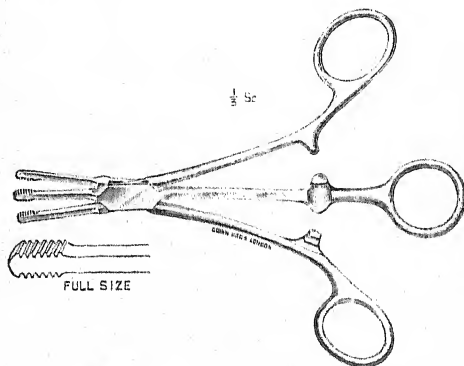
These forceps are made in stainless steel by Chas. F. Thackray, Park Street, Leeds, and 252, Regent Street, London.

$\frac{1}{2}$  Sc



*Fig. 146.*

**Non-rocking Bronchoscopic Forceps.**—The advantage claimed for the forceps designed by Mr. Denis J. Browne is that the distal point can be held perfectly steady during the closure of the forceps (*Fig. 146*). The three fingers and thumb of the surgeon's hand hold the rigid handle to which the distal point is attached. The action of the first finger slides the tube along the forceps stilette and owing to the mechanism device employed there is no tendency for this tube to rock in either an upward or downward direction. The makers are Down Bros. Ltd., St. Thomas's Street, London, S.E.



*Fig. 147.*

**Peritoneum Forceps.**—A tri-blade forceps (*Fig. 147*) for approximating the peritoneum has been designed by Mr. Denis J. Browne, of London. This forceps, which is a modification of the design of the Pannett rectus forceps, differs in the fact that it is made with a box joint, ensuring absolute rigidity and correct approximation of the points. The length of the jaw gives a wider gape and the shape of the centre blade (as the illustration shows) is thought to be more convenient than in the original model. The makers are Down Bros. Ltd., St. Thomas's Street, London, S.E.



*Fig. 148.*

**Tetra Forceps.**—Dr. E. W. Lewis, of Southport, draws attention to the following special points of advantage in his improved tetra forceps (*Fig. 148*): (1) Length of forceps is convenient (larger ones are apt to be in the way). (2) The forceps lie flat and out of the way owing to the curve in the shanks and specially owing to the finger rings being at right angles to the grip of the teeth. The finger rings, therefore, do not stick up under the tetra cloths. (3) The size of the jaw enables the forceps to be applied and taken off with one hand with the greatest of ease. (4) The double teeth prevent the forceps from sliding about under the tetra cloth. (The Holborn Surgical Instrument Co. Ltd., 26, Thavies Inn, E.C.1.)

**Gastrophotor.**—This apparatus for taking photographs of the stomach wall in the living subject was fully described by Dr. Stanley Wyard in *The Lancet*, July 25, 1931, p. 177. It has long been possible to reveal the size and shape of the stomach and any abnormality or irregularity in its outline by radiography; but with the gastrophotor a permanent and visible record is obtained of the condition of the interior of the organ, though not of its size and shape. It is thus evident that the two methods supplement each other. Messrs. Allen & Hanburys Ltd., 48, Wigmore Street, W.1, will gladly supply full particulars of the apparatus.

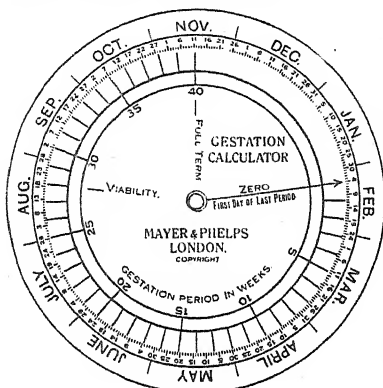


Fig. 149.

**Gestation Period Calculator.**—Unlike other calculators this pattern (Fig. 149), by Prof. D. Dougal, of Manchester, not only gives the expected date of delivery but it also gives the period of gestation in weeks on any required date or, conversely, the date on which any period of gestation will be reached.

*Example.*—Mrs. X attends on May 15, and states that her last menstrual period commenced Feb. 4. When adjusted the Calculator will show that she expects on Nov. 11, and is fourteen weeks pregnant. On examination she is found to have a moderate degree of pelvic contraction and the most suitable treatment is thought to be induction of labour at the thirty-sixth week. A further reference to the Calculator tells you that this treatment must be carried out on Oct. 13. (Mayer & Phelps, 59-61, New Cavendish Street, W.1.)

**Gouge.**—This new gouge (Fig. 150), as made in 11 sizes for Mr. E. A. Peters, has the bevel on the reverse side, which prevents slipping. (Krohne & Sesemann, 37, Duke St., W.1.)



Fig. 150.

**Inhaler (Metcalf's).**—This simple ether inhaler (Fig. 151) is so constructed that the percentage of vapour can easily be regulated and it is very economical in use. (Allen & Hanburys Ltd., 48, Wigmore Street, W.1.)

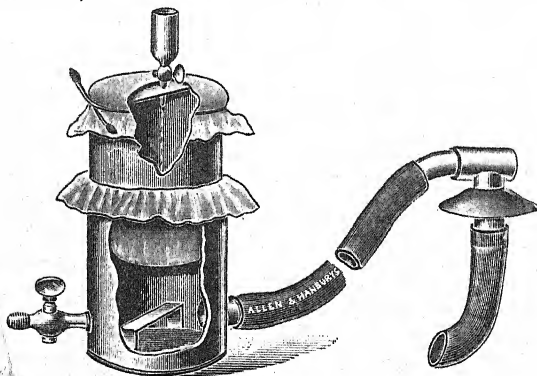


Fig. 151.

**Jaw Prop (Metcalf's).**—This jaw prop (Fig. 152) is designed to keep the jaw up during anaesthesia. It is adjustable in length, fitted with a rubber cushion at each end, one end being placed upon the chest and the other against the jaw. (Allen & Hanburys Ltd., 48, Wigmore Street, W.1.)

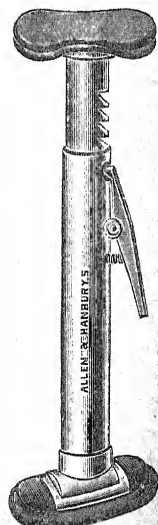


Fig. 152.

**Lumbar Puncture Needle.**—A slight modification of the spinal anæsthetic needle, which is known by various names in this country—Duttner's, Hoyst, Vienna Model. This needle (*Fig. 153*) has been made with very fine gauge for Col. L. W. Harrison to meet the following requirements:—

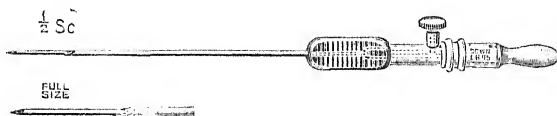


Fig. 153.

When the inner needle with its stilette and outer cannula are correctly assembled, the needle forms a fine solid rod for piercing the cartilage: but when the surgeon feels the point has penetrated the spinal canal, the fine inner cannula is protruded. It is thought that the use of such a fine needle will be an effective aid in the prevention of post-operative headache. The makers are Down Bros. Ltd., St. Thomas's Street, London.

**Mastoid Retractor.**—Mr. W. I. Daggett has devised a simple self-retaining mastoid retractor (*Fig. 154*), which provides excellent access to the bony cavity in the centre of the wound, as well as to the infected cells towards zygoma, mastoid tip, or angle between sinus and middle fossa dura.

By its use hæmostasis is satisfactorily attained, and when once in position, the small hooks do not slip out of place. (Mayer & Phelps, 59-61, New Cavendish Street, London, W.1.)

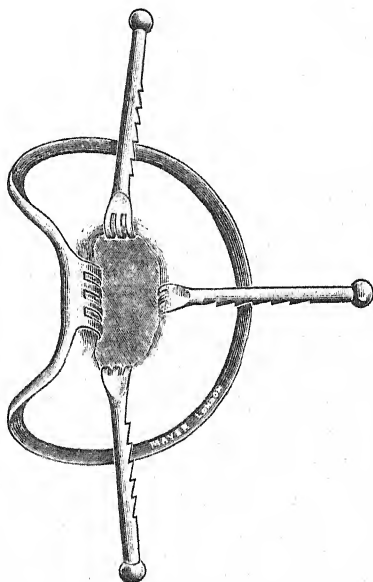


Fig. 154.

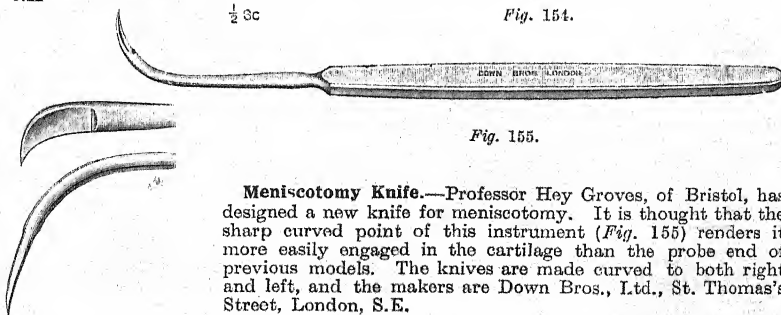
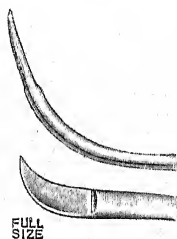
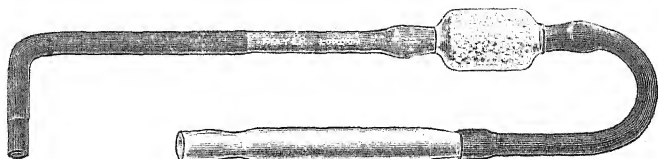


Fig. 155.

**Meniscotomy Knife.**—Professor Hey Groves, of Bristol, has designed a new knife for meniscotomy. It is thought that the sharp curved point of this instrument (*Fig. 155*) renders it more easily engaged in the cartilage than the probe end of previous models. The knives are made curved to both right and left, and the makers are Down Bros., Ltd., St. Thomas's Street, London, S.E.

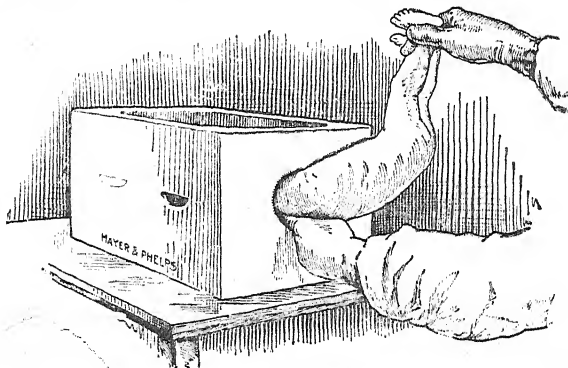
**Mucus Evacuator.**—This simple appliance (*Fig. 156*) is used in the Obstetric Unit, University College Hospital, London. The rubber part can be detached and the glass



*Fig. 156.*

bulb sterilized by boiling: it is therefore more hygienic than the older pattern, and is inexpensive. (Mayer & Phelps, 59-61, New Cavendish Street, London, W.1.)

**Obstetrics, Model for Teaching.**—Prof. D. Dougal (Manchester), has devised a simple model (*Fig. 157*) for teaching practical obstetrics. Being made of earthenware without any fittings whatever it can be used for actual still-born foetuses.



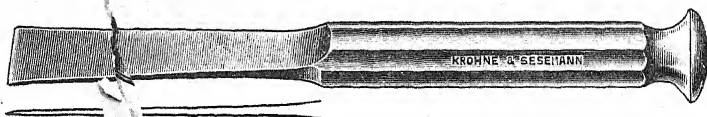
*Fig. 157.*

Professor Dougal's idea is to have sufficient of these models to enable a small class of students to learn for themselves the disposition of the foetus in utero, the mechanism of labour, and the various manipulations used in practical obstetrics. (Mayer & Phelps, 59-61, New Cavendish Street, London, W.1.)

**Operation Table.**—The well-known St. Bartholomew's Hospital Pattern Operating Table has recently been improved by the substitution of 'Nickeloid' for the top of the table, also for the fittings, in place of zinc.

'Nickeloid' is of English manufacture, and has the inestimable advantage that it does not tarnish and requires the minimum of labour to keep it clean.

The table can also now be supplied mounted upon a square base, which is a very great comfort and convenience to surgeons. When standing, one foot can be rested on the base, and, when sitting, it forms a comfortable platform for the feet. (Allen & Hanburys Ltd., 48, Wigmore Street, W.1.)



*Fig. 158.*

**Osteotome.**—This instrument (*Fig. 158*) is slightly thinner in the blade than usual, and is made in six sizes for Mr. A. S. B. Bankart. (Krohne & Sesemann, 37, Duke Street, W.1.)



**Stirrups (Page's)**—Mr. Max Page has improved the well-known Kirschner's stirrup, noticed in the 1930 volume, by fitting a simple screw extension (see *Fig. 162*) for tightening the wire in place of the more complicated Kirschner's pattern. (Allen & Hanburys Ltd., 48, Wigmore Street, W.1.)

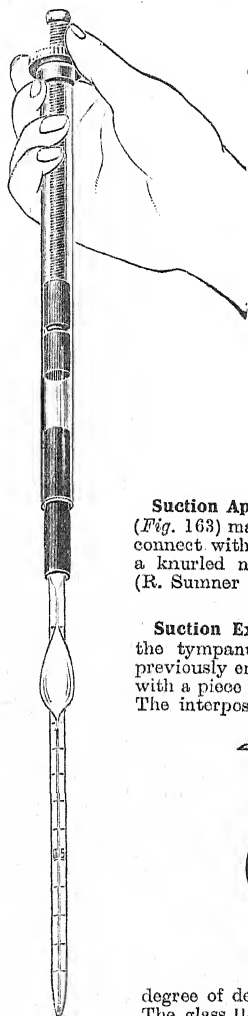


Fig. 163.

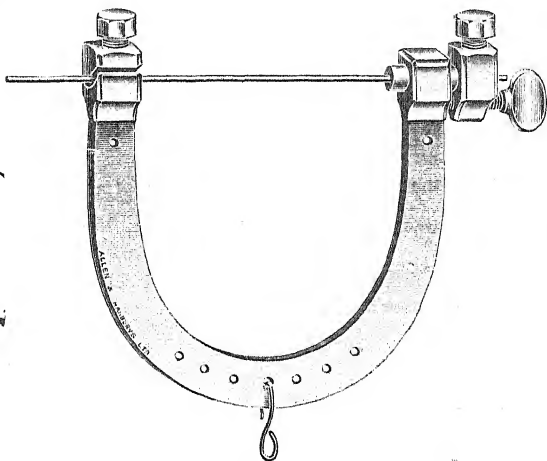


Fig. 162.

**Suction Apparatus for McLean's Blood Pipette.**—This is an apparatus (*Fig. 163*) made on the Record syringe principle, with rubber adaptor to connect with McLean's Pipette, for drawing of blood slowly by means of a knurled nut operating on the piston-rod. Price 8s. 6d. each net. (R. Sumner & Co. Ltd., 40, Hanover Street, Liverpool.)

**Suction Exploratory Needle.**—This needle (*Fig. 164*) for exudation into the tympanum, made for Sir James Dundas Grant, differs from those previously employed, in being attached to a U-shaped glass tube furnished with a piece of indiarubber tubing and glass tip for the explorer's mouth. The interposition of the indiarubber tube for aspiration gives a greater

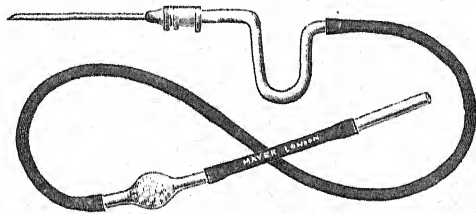


Fig. 164.

degree of delicacy than a syringe can give even in the most skilful hands. The glass U-tube acts as an efficient handle, and if the proximal limb is shorter than the distal one the view is as little impeded as possible. In addition, the upper portion of the mount of the needle is flattened down. (Mayer & Phelps, 59-61, New Cavendish Street, London, W.1.)

**Suture Needle with Double Prongs.**—Sir W. I. de Courcy Wheeler has devised a double-prong needle for Halsted's suture. The needle illustrated (*Fig. 165*) is of the Doyen variety. The handle carries twin needles. The standard pattern is so designed that a Halsted suture can be quickly introduced through the deeper layers of the abdominal wall in cases where difficulty is experienced in fat subjects or when laxity

cannot be obtained. The eyes are sufficiently large to allow the passage of a straight needle for threading purposes.

When the catgut is in position the loop between the two eyes should be pulled out several inches before withdrawing the needle. Otherwise withdrawal is difficult, and

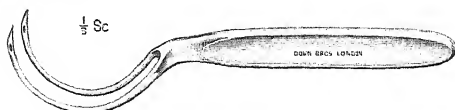


Fig. 165.

the catgut may become frayed. The use of the needle is illustrated in an article on p. 505 of this volume.

The twin needles are made in several sizes, and with varying spaces between the two. The makers are Down Bros. Ltd., St. Thomas's Street, London, S.E.

**Syringe (The 'Fenton').**—Dr. W. J. Fenton, Physician to the Hospital for Consumption and Diseases of the Chest, Brompton, has designed an anæsthetic spray, laryngeal mirror, and a special syringe (Fig. 166) for a simplified method for the injection of lipiodol by

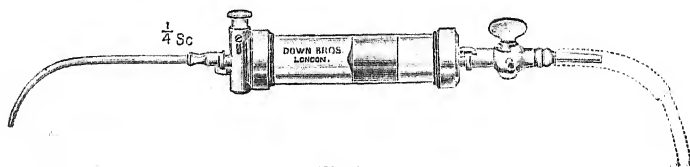


Fig. 166.

means of air pressure. Dr. Fenton has fully explained his technique in an article entitled "The Technique of Intralaryngeal Injection of Lipiodol" which appeared in the *British Medical Journal*, August 1st, 1931.

The makers are Down Bros. Ltd., St. Thomas's Street, London, S.E.

**Syringe (Two-piece 'Aglá').**—Many practitioners appreciate the simplicity which is a feature of the two-piece syringe, and to meet the demand which has arisen for this type of instrument, Burroughs Wellcome & Co. have issued the following in spirit-tight containers:—

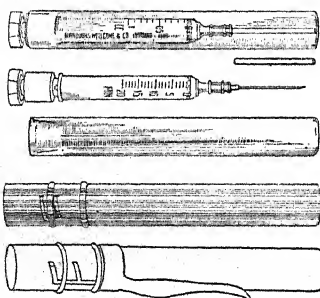


Fig. 167.—Detachable pocket-clip in position (for 1 c.c. size only). Reduced facsimile.

1 c.c. 'Aglá' Two-piece Syringe (also graduated in minims).

1 c.c. 'Aglá' Two-piece Insulin Syringe, graduated in  $\frac{1}{10}$  of 1 c.c.

5 c.c. 'Aglá' Two-piece Syringe.

10 c.c. 'Aglá' Two-piece Syringe.

With the aid of these compact outfits (Fig. 167), an 'Aglá' two-piece hypodermic syringe, with a needle in position, may be carried ready for immediate use. The outfits consist of an 'Aglá' hypodermic two-piece syringe, fitted with a rustless steel needle, in a glass container, the whole enclosed in a cylindrical metal case. By an ingenious arrangement the tube containing the spirit can be replaced in the metal case without fear of spilling the contents whilst the syringe is in use. The piston acts as a stopper and fits firmly into the glass container, thus preventing evaporation or leakage of the alcohol, in which the syringe is constantly immersed.

The graduations on the barrel are exceptionally clear and permanent, being baked in by a special process, and the piston has a blue tip which records, at a glance, the quantity of fluid in the syringe.

These advantages appeal strongly to the medical practitioner and do much to promote the demand for this type of syringe.

**Syringe Case (Milroy Paul's).**—This case holds a standard Record syringe, but to the top of the case is attached a stand (see *Fig. 168*) to hold the syringe both when it is in the spirit and afterwards when it has been removed from the case. (Allen & Hanburys Ltd., 48, Wigmore Street, W.1.)

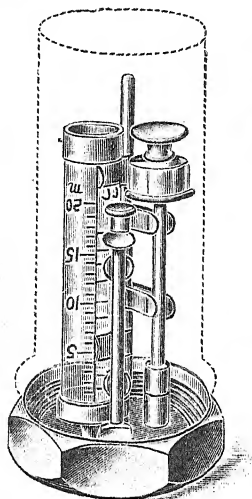


Fig. 168.

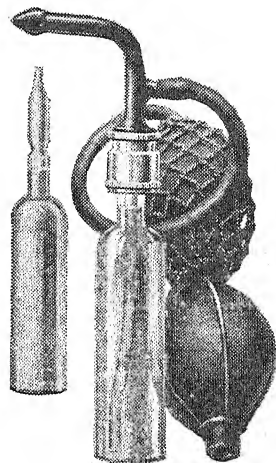
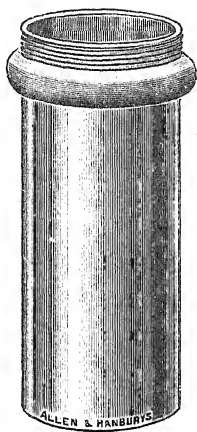


Fig. 169.

**Tannic Acid Spray Adaptor.**—The treatment of burns with tannic acid has hitherto suffered from the disadvantage that solutions *must be freshly prepared*, a matter of great moment when time is precious. In order to overcome the difficulty, and to ensure that this valuable aid in an emergency may always be immediately available, the Crookes Laboratories have devised and are issuing a special stable solution, and the Collosol Spray Adaptor (*Fig. 169*), which will ensure the effective application of unaltered stable solution. Collosol tannic acid, 2.5 per cent, is supplied in specially sealed ampoules for use with this Spray Adaptor. (British Colloids Ltd., Park Royal, N.W.10.)

**Thomas Hip Splint.**—Mr. H. E. Rawlence, of Southampton, has devised a new form of hip splint (*Fig. 170*), based in all particulars upon the principles of a Thomas hip splint. It packs flat for use in an ambulance. It has a swivel joint on either

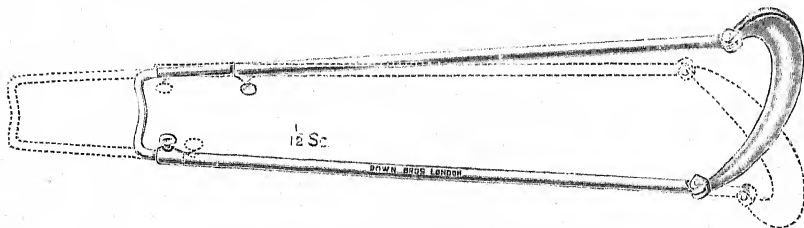


Fig. 170.

bar below the buttock half circle. This allows for the splint being used for the right or left lower extremity as required. The anterior half circle being removed allows of application with ease and without pain.

The splint is intended for temporary use in motor accidents, and for moving patients by road. (Down Bros. Ltd., St. Thomas's Street, London, S.E.)

**Tongue Spatula.**—This British-made glass spatula named 'The Brilight' (*Fig. 171*) fits into a metal holder containing an ordinary torch bulb. The light is transmitted through the spatula to the distal end, throwing the rays on to the throat and the back of the mouth, without glare at the sides.

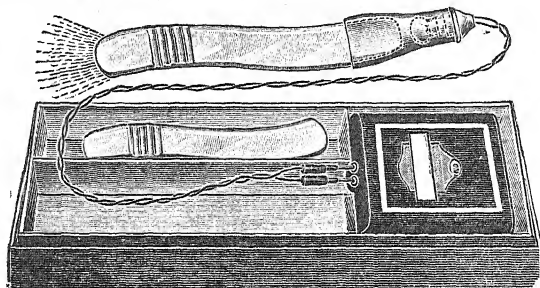


Fig. 171.

Two spatulae are supplied, one for adults and one for children, with lamp socket, cords, and battery in hinged box. The spatulae are made in best quality glass and are serrated to grip the tongue. The spatulae and holder may be sterilized by boiling.

These outfits are supplied by The Holborn Surgical Instrument Co. Ltd., 26, Thavies Inn, E.C., and by R. Sumner & Co. Ltd., 40, Hanover Street, Liverpool.

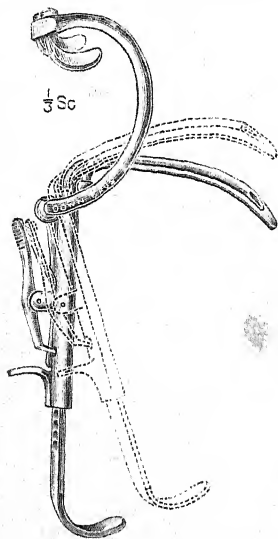


Fig. 173.

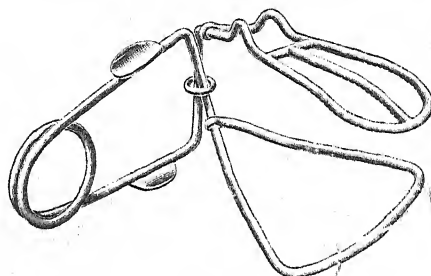


Fig. 172.

**Tongue Depressor (Self-retaining).**—This instrument (*Fig. 172*) has a spring action, the lower portion fitting under the patient's chin. When in position both hands of the operator are left free. Price 7s. 6d. each net. (R. Sumner & Co. Ltd., 40, Hanover Street, Liverpool.)



Fig. 174.

**Tonsil Enucleation Instruments.**—We illustrate (*Fig. 173*) a Boyle type of gag fitted with a rocking joint so that the end of the tongue spatula can be tilted up as desired in order to relax tension on the anterior pillars of the fauces. The frame takes any standard pattern of Boyle tongue plate. This has been designed for Mr. O. O. Popper, as well as an Adenoid Plane with removable blades (*Fig. 174*).

The well-known Popper's plane with removable blades has been supplied to many of the surgeons of the Royal Infirmary, Edinburgh, fitted with the addition of a little spirit-tight box to hold the blades. The instrument is now made without the blade-carrying box in the handle, as many surgeons have found that this original design has led to blades being found rusty when required for use. The makers of both instruments are Down Bros. Ltd., St. Thomas's Street, London, S.E.

**Tonsil Ecraseur.**—The idea of encircling tonsils by means of an inner solid ring (R), moving from behind forwards, was originated as long ago as 1832 by W. B. Fahnestock, of Philadelphia. C. B. Meding, in America, has adopted this principle in his guillotine, a straight implement resembling Beck's snare. He claims very good results both from the point of view of complete enucleation and minimum loss of blood. Mr. T. B. Layton has added a handle of the Morel McKenzie type.

Dr. T. B. Jobson has been using a further modification (*Fig. 175*) of Fahnestock's tonsil écraseur. This has a double handle which affords a squeezing action. The advantages of this instrument are: (1) It gives good leverage for enucleating the tonsil by the Whilliss method. (2) As the ring draws the tonsil from behind forwards, it safeguards the anterior pillar from injury. (3) After the tonsil is firmly gripped in the ring by squeezing the handle, the process is continued by bringing the screw into action. By slowly rotating the ring (S) the base of the tonsil is strangled and separated. If five minutes are allowed for each tonsil, the separation is practically bloodless and causes a minimum amount of trauma.

Its drawbacks are that it is not suitable for rapid tonsillectomy with ethyl chloride; it also requires a prominent tonsil. For a flat tonsil, Jenkin's guillotine is preferable. Down Bros. Ltd., of London, are the makers.

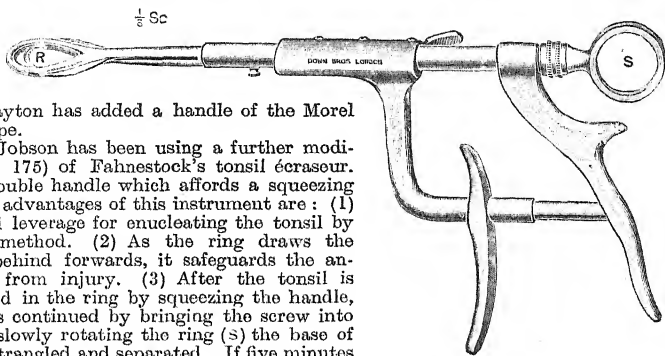


Fig. 175.

**Tonsil Pus Expressor.**—This instrument (*Fig. 176*), designed by Dr. C. Berkeley Way, is made of stainless steel, and is similar to a tongue depressor with fenestrated end, the difference being the addition of a gutter encircling the upper surface of the fenestrum.

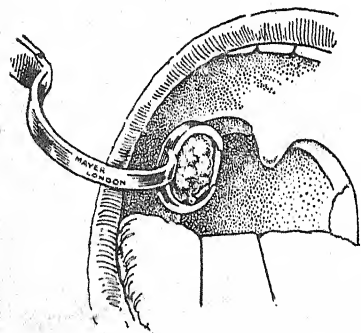


Fig. 176.

After gargling, first with an antiseptic and after with sterilized water, the instrument is placed against the tonsil with an outward pressure to empty the crypts; then a slight upward movement is made to collect the pus in the gutter. The instrument can now be removed from the mouth without contamination with other oral fauna and flora, and the pus collected on a sterile swab for bacteriological purposes, or demonstration to the patient. As the gutter encircles the fenestrum, the instrument can be used for both tonsils.

If tonsillectomy is declined, the other forms of treatment, e.g., ultra-violet radiation, diathermy, London paste, etc., are best precluded by the emptying of the tonsillar crypts. (Mayer & Phelps, 59-61, New Cavendish Street, London, W.1.)

**Trusses (Salmon Ody).**—Messrs. Salmon Ody, Ltd., 7, New Oxford Street, W.C., who have been established over 130 years, have a new system of measurements for their world-renowned ball-and-socket trusses. It not only gives the shape and strength of springs, but sizes and pressure point of pads as well, which is a boon, and these are recorded for future reference.

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**Uterine Cannula.**—Mr. J. Drew Smythe, Gynaecologist to the General Hospital Bristol, has designed this instrument (*Fig. 177*) to render the intra-uterine injection of glycerin a simple procedure without disturbing the patient too much. It has the advantage over other instruments of like nature that it is rigid and can be inserted

by 'feeling' for the opening of the cervix with the cannula itself, and there is no necessity for inserting a guiding finger, or, in the majority of cases, even a speculum.



Fig. 177.

After inserting the cannula, a Record or other syringe, containing 2 oz. of glycerin is fitted to the end and slowly injected into the uterus.

This cannula was first made by a firm in Leeds and later by Down Bros. Ltd., of London.

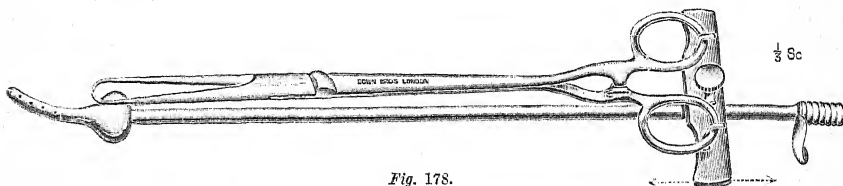


Fig. 178.

Major W. C. Spackman, I.M.S., Civil Surgeon, Poona, India, has designed another form of uterine cannula (Fig. 178) to be used for the Rubin test for patency of the Fallopian tubes with any of the inflation methods. Its special feature is the sliding bracket to take the finger holes of the vulsellum. The latter is applied as usual to get a good grip of the cervix on its vaginal aspect in the anterior fornix. The cannula is now passed in the usual manner (it is of a size that no dilatation is needed as a rule) till the acorn is firmly pressed into the external os. The handle of the vulsellum is now applied on to the hooks of the bracket, which is firmly braced outwards by two fingers of the right hand against the pressure of the thumb of the same hand on the thumb grip on the outer end of the cannula. When by this means the tension of the acorn against the cervix is deemed to be adequate, the bracket is fixed by the finger screw provided. The cannula and vulsellum are thus easily controlled by one hand while the inflation is carried out.

The makers are Down Bros. Ltd., St. Thomas's Street, London, S.E.

**Vaginoscope.**—An expanding electric vaginoscope (Fig. 179) with many new features has been placed on the market by John Smith & Son (Glas.) Ltd., 28, Gibson Street, Hillhead, Glasgow, W.2, to a design suggested by Mr. John Hewitt.

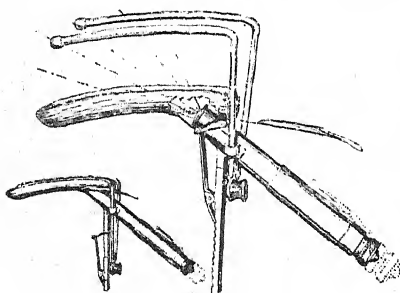


Fig. 179.

Entirely operated by one hand, the instrument affords an uninterrupted and illuminated view of the cervix and vaginal vault. Exposing the entire vaginal wall except the small area concealed by the narrow blade, the variable expansion renders the instrument suitable for both the normal and the capacious vagina.

The fixed curved blade reaches well into the posterior fornix, while the lengthwise curve carries the tip of the instrument behind the cervix.

The two lateral expanding rods, when raised, distend and retract the antero-lateral walls. The rods are raised by placing the thumb on the thumb rest and pulling up the swivel

pin with the forefinger. As the rods rise they separate and are held in position by a spring ratchet. A quick release is provided.

The instrument is fitted with a protector cover over the lamp, so that blood or discharge can be swabbed away without soiling the lamp, which is detachable so that the instrument may be sterilized.

This vaginoscope can be supplied with self-contained torch with switch, or with special lamp fitted with flex and connected to a large capacity American battery handle with switch.

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\* \* For the convenience of our readers any of the works in this list can be obtained through  
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*The Retreat, Armagh.*—Apply, Res. Med. Supt., or Capt. A. D. Allen. Richhill station,  $1\frac{1}{2}$  miles, or Armagh station, 3 miles.

**Ayr.**—*Glengall Hospital.* Med. Supt., Douglas MacRae, M.D., F.R.C.P. Ayr station, 2 miles.

**Ballinasloe (Co. Galway).**—*Ballinasloe Mental Hospital.* Res. Med. Supt., John Mills, M.B. Ballinasloe station, 2 miles.

**Banffshire.**—*District Asylum, Ladysbridge.* Res. Med. Supt., Dr. George M. Bell. Ladysbridge station, 300 yards.

**Baschurch (Shropshire).**—*Boreatton Park, 10 miles from Shrewsbury.* Res. Med. Supt., Dr. E. H. O. Sankey. Baschurch,  $2\frac{1}{2}$  miles. See also *Advt.*, p. 99

**Basingstoke (Hants.).**—*Park Prewett Mental Hospital.* Res. Med. Supt., V. Lindley Connolly, M.C., M.B., B.Ch. Basingstoke, 2 miles.

**Bath.**—*Bailbrook House.* Res. Med. Supt., S. J. Gilfillan, O.B.E., M.B. Bath, G.W., or L.M. & S.R., 10 minutes' drive. See also *Advt.*, p. 106

**Bedford.**—*Bishopstone House* (for 10 ladies). Proprietress, Mrs. B. Peele. See also *Advt.*, p. 100

*Springfield House Private Mental Hospital*, near Bedford. 1 hour from London. Better class only received, with or without certificates. Including separate bedrooms for all suitable cases. Ordinary terms 5 gs. Res. Med. Supt., Cedric W. Bower. Bedford,  $1\frac{1}{2}$  miles, L.M. & S.R. Tel. No. 3417. See also *Advt.*, p. 104

**Belfast.**—*Belfast Mental Hospital, Purdysburn, near Belfast.* Res. Med. Supt., Dr. S. J. Graham. Belfast, G.N.R. station, 3 miles.

**Beverley.**—*East Riding of Yorkshire County Mental Hospital.* Res. Med. Supt., T. M. Davie, M.C., M.D. Beverley station, 2 miles.

**Birmingham.**—*Rubery Hill and Hollymoor Mental Hospital.* Res. Med. Supt., T. C. Graves, M.D., F.R.C.S. Rubery station,  $\frac{1}{2}$  mile; Northfield, L.M. & S.R., 1 mile.

*Birmingham City Mental Hospital.* Winsor Green. Res. Med. Supt., Dr. C. W. Forsyth. Birmingham,  $1\frac{1}{2}$  miles; Soho,  $\frac{1}{4}$  mile.

**Bodmin.**—*Cornwall County Mental Hospital.* Res. Med. Supt., Dr. W. G. Rivers. Bodmin station, G.W.R. and S.R., 1 mile.

**Box (Wilts.).**—*Kingsdown House.* 5 miles from Bath. Res. Med. Supt., Dr. H. C. MacBryan. See also *Advt.*, p. 100

**Bridgend.**—*Glamorgan County Mental Hospital.* Res. Med. Supt., D. Finlay, M.D. Bridgend,  $1\frac{1}{2}$  miles.

**Bristol (near).**—*Brislington House.* Res. Physician, Dr. F. E. Fox. Bristol, 3 miles.

*Bristol Mental Hospital, Fishponds.* Res. Med. Supt., Dr. E. T. White. Clerk and Steward, A. W. King. Fishponds station, 1 mile.

*Northwoods*, Winterbourne, Bristol. Res. Phys., Joseph Cates, M.D.(Lond.).

*See also Advt., p. xlvii*

**Bromsgrove (Worcs.).**—*Worcestershire Mental Hospital*, "Barnsley Hall". Res. Med. Supt., Dr. P. T. Hughes. Bromsgrove, L.M. & S.R.,  $2\frac{1}{2}$  miles.

**Burgess Hill (Sussex).**—*St. George's Retreat*. Licensee, Miss Mary Doran. Med. Supt., Dr. R. D. Pennefather. Burgess Hill station, 2 miles.

**Burley-in-Wharfedale (Yorks.).**—*West Riding Asylum*, Sealehor Park. Res. Med. Supt., Dr. J. R. Gilmour. Burley-in-Wharfedale station, L.M. & S.R.,  $\frac{1}{4}$  mile.

**Buxton.**—*Wye House*. Res. Med. Supt., W. W. Horton, M.D.\* Buxton, L.M. & S.R., 10 minutes. *See also Advt., p. 109*

**Caerleon (Mon.).**—*Newport Mental Hospital*. Res. Med. Supt., Dr. M. R. Mackay, M.C. Caerleon,  $\frac{1}{2}$  mile.

**Cambridge.**—*County Mental Hospital*, Fulbourn. Res. Med. Supt., Dr. Travers Jones. Cambridge station,  $3\frac{1}{2}$  miles.

**Canterbury.**—*Stone House*, St. Martin's. Res. Med. Supt., Dr. E. F. Sall. Canterbury East.

**Cardiff.**—*Cardiff City Mental Hospital*, Whitechurch (Glam.). Res. Med. Supt., P. K. McCowan, M.D., M.R.C.P. Llandaff, G.W.R. station. 1 mile.

**Carlisle.**—*Cumberland & Westmorland Mental Hospital*. Res. Med. Supt., J. T. Herbert Madill, M.B., Ch.B. Carlisle, 3 miles.

**Carlow.**—*District Mental Hospital*. Res. Med. Supt., Dr. T. A. Greene. Carlow,  $\frac{1}{2}$  mile.

**Carmarthen.**—*Joint Counties Mental Hospital*. Res. Med. Supt., J. Richards, M.B., F.R.C.S.E. Carmarthen, G.W.R. station, 2 miles.

**Castlebar (Co. Mayo).**—*Co. Mayo Mental Hospital*. Res. Med. Supt., Alfred Sheridan, L.R.C.P. and S.I. Castlebar, 1 mile.

**Chartham (near Canterbury).**—*Kent County Mental Hospital*. Res. Med. Supt., M. A. Collins, M.D. Chartham, 1 mile; Canterbury, 3 miles.

**Cheadle (Cheshire).**—*Cheadle Royal Mental Hospital*. Res. Med. Supt., J. A. C. Roy, M.B., Ch.B. Heald Green, 1 mile. *See also Advt., p. 98*

**Chester.**—*Cheshire County Mental Hospital*. Res. Med. Supt., G. Hamilton Grills, M.D. Chester station,  $1\frac{1}{2}$  miles.

**Chichester.**—*West Sussex Mental Hospital*, Graylingwell. Res. Med. Supt., C. G. Ainsworth, M.A., LL.B., M.B., B.Ch. Chichester station,  $1\frac{1}{2}$  miles.

**Church Stretton (Shropshire).**—*Stretton House* (for gentlemen). Man. Director, S. T. H. Lane. Res. Med. Supt., Dr. J. C. Baker. Church Stretton station,  $\frac{1}{2}$  mile.

*See also Advt., p. 106*

*The Grove House*, All Stretton, Shropshire (for ladies). Res. Prop. and Med. Supt., Dr. J. McClintock.

**Clonmel.**—*District Mental Hospital*. Res. Med. Supt., Dr. J. F. Fitzgerald. Clonmel, 1 mile.

**Colchester.**—*Severalls Mental Hospital*. Res. Med. Supt., Dr. R. C. Turnbull. Colchester,  $1\frac{1}{2}$  miles.

**Cork.**—*Cork District Mental Hospital*. Res. Med. Supt., Dr. — — —. Cork,  $2\frac{1}{2}$  miles.

*Lindville Private Mental Hospital*, Cork. Proprietress, Mrs. Osburne. Res. Med. Off., Dr. J. C. Osburne. Cork station, 2 miles by tram.

**Cupar (Fifeshire).**—*Fife District Asylum*. Res. Med. Supt., William Boyd, M.B., Ch.B. Springfield station, N.B.R.,  $\frac{1}{2}$  mile.

**Darlington (Durham).**—*Middleton Hall*, Middleton St. George. Med. Supt., Dr. J. W. Astley Cooper. Res. Med. Off., Dr. T. C. Barkas. Dinsdale station, 1 mile.

**Dartford (Kent).**—*Stone House*, near Dartford. (Under the management of the Corporation of the City of London.) Res. Med. Supt., Dr. William Robinson. Dartford station, 2 miles.

*See also Advt., p. 102*

**Denbigh (North Wales).**—*North Wales Counties Mental Hospital*. Med. Supt., Frank G. Jones, M.B. Denbigh, 1 mile.

**Derby.**—*Borough Mental Hospital*, Rowditch. Res. Med. Supt., Dr. John Bain. L. & N.E.R. station, 1 mile; L.M. & S.R., 2 miles. *See also Advt., p. 103*  
*The County Mental Hospital*, Mickleover. Derby. Res. Med. Supt., Dr. E. L. Hopkins. Derby, L.M. & S.R., 5 miles; Mickleover, L. & N.E.R., 2 miles.

**Devizes.**—*Wills County Mental Hospital*. Res. Med. Supt., S. J. Cole, M.D.

**Dorchester.**—*Dorset Mental Hospital*. Res. Med. Supt., P. W. P. Bedford, M.D. Dorchester, 3 miles.

**Downpatrick.**—*Down County Mental Hospital*. (840 beds.) Res. Med. Supt., M. J. Nolan, L.R.C.P.I. and S.I., J.P., Downpatrick, 1 mile.

**Dublin.**—*Bloomfield*, Morehampton Rd. Med. Off., H. T. Bewley, M.D.

*Farnham House and Maryville*, Finglas, Co. Dublin. Res. Med. Supt., H. R. C. Rutherford, F.R.C.S.I., D.P.H. Motor bus from Dublin, 2 miles.

*See also Advt., p. 105*

*Grangegorman Mental Hospital*, Dublin. Res. Med. Supt., Dr. J. O'Connor Donelan. Also *Portrane Branch*, Donabate, Co. Dublin. Dep. Res. Med. Supt., Dr. S. Blake. Donabate station,  $1\frac{1}{2}$  miles.

*Highfield* (for ladies), Drumcondra; *Hampstead* (for gentlemen), Glasnevin. Res. Med. Supt., Wm. N. Eustace, L.R.C.P.I. and S.I. By rail, Dublin.

See also *Advt.*, p. 106

*House of St. John of God*, Stillorgan, Dublin. Res. Phys., Dr. J. J. Boland. Stillorgan station,  $\frac{1}{4}$  mile.

*St. Patrick's Hospital*, James's Street, Dublin. Res. Med. Supt., Dr. R. R. Leeper. Branch Asylums at *St. Edmondsbury*, Lucan.

See also *Advt.*, p. 94

*St. Vincent's Mental Hospital*, Fairview, Dublin. Vis. Physicians, John Murphy, F.R.C.P.I., and F. X. Callaghan, F.R.C.P.I. Apply to the Superiress.

*Stewart Institution and Hospital for Mental Diseases*, Palmerstown, Co. Dublin. Res. Med. Supt., G. H. Keene, M.D. Kingsbridge,  $2\frac{1}{2}$  miles.

*Verville Retreat*, Clontarf, near Dublin. Prop., P. D. Sullivan, F.R.C.S.I. Clontarf, 1 mile.

**Dudley (Stafford).**—*Ashwood House*, Kingswinford. Props., Drs. Peacock and Pietersen. Res. Med. Supt., Dr. J. F. G. Pietersen. Stourbridge Junc.,  $3\frac{1}{2}$  miles; Dudley station, 4 miles; Wolverhampton, 7 miles. Tel.: 19 Kingswinford.

See also *Advt.*, p. 105

**Dumfries.**—*Crichton Royal*. Res. Med. Supt., Dr. C. C. Easterbrook. Dumfries, 1 mile.

**Dundee.**—*Baldovan Institution* (for the treatment and education of mental defectives). Res. Med. Supt., D. J. Forbes, M.B., Ch.B. Downfield, 1 mile; Dundee,  $4\frac{1}{2}$  miles.

*Dundee Mental Hospital*, Westgreen, Dundee. Res. Med. Supt., W. Tuach Mackenzie, M.D. Dundee, 3 miles; Liff,  $1\frac{1}{2}$  miles.

*Dundee Royal Asylum*, Gowie House, Dundee. Med. Off., A. B. Daggetty, M.D. Sec., J. Wilkie, 27, Bank Street, Dundee.

**Durham.**—*County Mental Hospital*, Winterton. Res. Med. Supt., Dr. G. F. May. Sedgfield station,  $2\frac{3}{4}$  miles, by bus.

*Gateshead Mental Hospital*, Stanington, Northumberland. Res. Med. Supt., Dr. H. E. Brown. Stanington, L. & N.E.R.,  $2\frac{1}{2}$  miles.

*Sunderland Borough Mental Hospital*, Ryhope, Durham. Res. Med. Supt., Dr. M. A. Archdale. Ryhope station, 1 mile.

**Edinburgh.**—*Edinburgh District Mental Hospital*, Bangour Village, West Lothian. Res. Med. Supt., W. M. McAlister, F.R.C.P.E. Uphall, L. & N.E.R., 2 miles.

*Midlothian and Peebles District Asylum*. Res. Med. Supt., James H. C. Orr, M.D. Rosslynlee, 1 mile; Edinburgh, 12 miles.

*New Saughton Hall*, Polton, Midlothian. Res. Med. Supt., Jas. H. Skeen, M.B. Polton, 5 minutes; Loanhead, 10 minutes' walk.

See also *Advt.*, p. 96

*Royal Edinburgh Hospital for Mental and Nervous Disorders*, Morningside. Res. Phys. Supt., Professor George Robertson. Edinburgh,  $1\frac{1}{2}$  miles.

**Elgin.**—*Morayshire District Asylum*. Res. Supt., Miss Annie A. Kinloch. Vis. Med. Off., Dr. A. C. Macdonald. Elgin,  $1\frac{1}{2}$  miles.

**Ennis (Co. Clare).**—*Clare Mental Hospital*. Res. Med. Supt., Dr. F. O'Mara. Ennis, 2 miles.

**Enniscorthy (Co. Wexford).**—*District Mental Hospital*. Res. Med. Supt., Dr. H. T. J. Kennedy. Enniscorthy, 1 mile.

**Epsom (Surrey).**—*The Silver Birches*, Church Street (for ladies). Licensees, Miss M. L. Oxford (Res.), Dr. E. G. C. Daniel. Southern Rly., 5 minutes. Tel.: 346 P.O. Epsom.

See also *Advt.*, p. 109

**Essex.**—*Brentwood Mental Hospital*, Essex. Res. Med. Supt., Dr. W. Gordon Masfield. Brentwood station,  $\frac{1}{2}$  mile.

*Littleton Hall*, Brentwood, Essex (for ladies). With or without certificate. Res. Med. Supt., Dr. H. G. L. Haynes. Brentwood, 1 mile; Shenfield,  $1\frac{1}{2}$  miles.

See also *Advt.*, p. 98

**Exeter.**—*City Mental Hospital*, Digbys, Exeter. Res. Med. Supt., D. McKinlay Reid, M.D. Exeter, 3 miles.

See also *Advt.*, p. 107

*Court Hall*, Kenton, near Exeter. Res. Licensees, Miss Mules, M.D., and Miss A. S. Mules, M.R.C.S. Starcross, 1 mile.

*Devon Mental Hospital*, Exminster. Res. Med. Supt., Richard Eager, O.B.E., M.D. Exminster,  $1\frac{1}{2}$  miles; Exeter, 4 miles.

*Wonford House Hospital for Nervous and Mental Disorders*, Exeter. Res. Med. Supt., H. W. Eddison, M.D., D.P.M. Exeter station (Queen St.),  $1\frac{1}{2}$  miles; (St. David's), 2 miles.

**Fairford (Gloucestershire).**—*Fairford Retreat*. Res. Med. Prop., Dr. A. C. King-Turner. Fairford, 1 mile.

**Fareham (Hants).**—*Knowle Mental Hospital*. Res. Med. Supt., Dr. J. L. Jackson. Knowle,  $\frac{1}{2}$  mile; Fareham,  $3\frac{1}{2}$  miles.

**Glasgow.**—*District Mental Hospital*, Woodilee. Res. Med. Supt., H. Carre, L.R.C.P. & S. Lenzie station, 1 mile; Glasgow, 8 miles.

*Glasgow District Mental Hospital*, Gartloch, Gartcosh. Res. Med. Supt., Dr. A. M. Dryden. Garnkirk station, 1 mile.

*Glasgow Royal Mental Hospital*, Gartnavel. Res. Med. Supt., D. K. Henderson, M.D.

*Hawkhead Mental Hospital*, Glasgow. S.W.2. Res. Med. Supt., Dr. J. H. MacDonald. Crookston station.

**Kirklands Mental Hospital**, Bothwell, Glasgow. Res. Med. Supt., Wm. M. Buchanan, M.B. Bothwell and Fallside stations,  $\frac{1}{2}$  mile; Glasgow, 9 miles.

**Lanark District Asylum**, Hartwood, Lanarkshire. Res. Med. Supt., Dr. N. T. Kerr. Hartwood, L.M.S. station,  $\frac{1}{4}$  mile.

**Smithston Asylum**, Greenock. Res. Med. Supt., Wm. Leggett, M.D. Greenock West,  $1\frac{1}{2}$  miles; Ravenscraig,  $\frac{1}{2}$  mile.

**Gloucester**.—**Barnwood House Hospital for Nervous and Mental Disorders**. Res. Med. Supt., Arthur A. D. Townsend, M.D. Gloucester, 2 miles. *See also Advt., p. 107*

**Gloucester County Mental Hospitals**, Wotton and Barnwood, Gloucester. Res. Med. Supt., Dr. F. C. Logan. Gloucester station, 1 mile.

**Guernsey**.—**St. Peter Port Asylum**. Med. Off., C. d'A. Collings, M.D.

**Haddington, N.B.**.—**East Lothian District Asylum**. Supt., Miss Jean Sinclair. Med. Off., H. H. Roberts, M.D. Haddington station, 10 minutes.

**Hatton (near Warwick)**.—**County Mental Hospital**. Res. Med. Supt., A. T. W. Forrester, M.D. Also **Leigh House**, for lady private patients. Warwick, G.W.R. station, 3 miles. *See also Advt., p. 108*

**Hawick (Roxburgh, N.B.)**.—**St. Andrews**, Stirches. Licensee, Sister Mary Agnes.

**Haywards Heath**.—**Brighton County Borough Mental Hospital**. Res. Med. Supt., G. H. Harper-Smith, M.A., M.D. Haywards Heath,  $1\frac{1}{2}$  miles.

**Hellingly**.—**East Sussex County Mental Hospital**, near Eastbourne. Res. Phys. and Med. Supt., F. R. P. Taylor, M.D., B.S. Hellingly station, 1 mile.

*See also Advt., p. 104*

**Henley-in-Arden (Warwickshire)**.—**Glen-dossill**. Res. Med. Supt., Dr. W. Agar. Henley-in-Arden, G.W.R.,  $\frac{3}{4}$  mile.

**Hereford**.—**Hereford County and City Mental Hospital**. Res. Med. Supt., Dr. G. W. H. T. Flening. Barrs Court, G.W.R. and L.M. & S.R., Hereford, 3 miles.

**Huddersfield (near)**.—**West Riding Mental Hospital**, "Storches Hall," Kirkburton. Res. Med. Supt., C. W. Ewing, L.R.C.P. and S.I., D.P.M. Kirkburton, L.M. & S.R., 1 mile.

**Hull**.—**City Mental Hospital**. Res. Med. Supt., Dr. J. S. Anderson. Willerby station, 1 mile; Hull, 6 miles.

**Inverness**.—**District Asylum**. Res. Med. Supt., T. C. Mackenzie, M.D., F.R.C.P. Edin. Inverness,  $2\frac{1}{2}$  miles.

**Ipswich**.—**The Mental Hospital**. Res. Med. Supt., P. Banbury, D.P.M. Ipswich, 2 miles.

**Isle of Man**.—**Mental Hospital**, Union Mills, Douglas. Res. Med. Supt., Leslie H. Skene, M.C., M.B., Ch.B., Dipl. Psych. Ed. Union Mills,  $\frac{1}{2}$  mile.

**Isle of Wight**.—**The County Mental Hospital**, Whitecroft. Res. Med. Supt., W. J. A. Erskine, M.D. Blackwater, 1 mile; Newport,  $2\frac{1}{2}$  miles.

**Ivybridge**.—**Plymouth Mental Hospital**. Res. Med. Supt., E. G. T. Poynder, M.R.C.S., L.R.C.P., D.P.M. Bittaford,  $\frac{1}{4}$  mile; Wrangaton, G.W.R.,  $1\frac{1}{2}$  miles; Ivybridge, 3 miles.

**Jersey**.—**Jersey Mental Hospital**. Res. Med. Supt., C. Noble le Brocq, M.D. Gorey Village, 1 mile.

**Kilkenny**.—**District Mental Hospital**, Kilkenny. Act. Med. Supt., Dr. P. J. Cassin. Kilkenny station,  $\frac{1}{4}$  mile.

**Killarney**.—**District Mental Hospital**. Res. Med. Supt., E. W. Griffin, M.D. Killarney,  $\frac{3}{4}$  mile.

**Lancashire (near Newton-le-Willows)**.—**Haydock Lodge**. Res. Med. Licensee, J. C. Wootton, L.R.C.P., M.R.C.S. Res. Med. Supt., F. M. Seal, M.B., M.R.C.S., L.R.C.P. Newton-le-Willows, L.M. & S.R., 2 miles. *See also Advt., p. 101*

**Lancaster**.—**County Mental Hospital**. Res. Med. Supt., R. P. Sephton, B.A., M.R.C.S., L.R.C.P. Lancaster, L.M. & S.R. stations, each  $1\frac{1}{4}$  miles.

**Leek (Stafford)**.—**County Mental Hospital**, Cheddleton. Med. Supt., W. F. Menzies, M.D. Wall Grange station, 1 mile.

**Leicester**.—**City Mental Hospital**, Hum-berstone. Res. Med. Supt., J. F. Dixon, M.D. Leicester, L. & N.E.R. and L.M. & S.R., 2 miles.

**Leicestershire and Rutland Mental Hospital**, Narborough, near Leicester. Res. Med. Supt., K. K. Drury, M.C., M.D., D.P.M. Narborough,  $\frac{3}{4}$  mile; Leicester, 6 miles.

**Letterkenny**.—**Donegal District Mental Hospital**. Res. Med. Supt., J. C. Martin, L.R.C.P. & S.I., L.M. Letterkenny and Lough Swilly Rly., or Strabane & Letterkenny Rly., 1 mile.

**Lichfield**.—**County Mental Hospital**, Burntwood, near Lichfield. Res. Med. Supt., W. Reid, M.A., M.B. Lichfield City,  $3\frac{1}{2}$  miles; Hammerwich,  $1\frac{1}{2}$  miles.

**Limerick**.—**District Mental Hospital**. Res. Med. Supt., Dr. P. J. Irwin. Limerick  $\frac{1}{2}$  mile.

**Lincoln**.—**Bracebridge Mental Hospital**. Res. Med. Supt., Dr. John Macarthur, D.P.M. Lincoln, L. & N.E.R.,  $2\frac{1}{2}$  miles. **The Lawn Registered Hospital**, Lincoln. Res. Med. Supt., Mary R. Barkas, M.Sc., M.D., B.S.Lond., D.P.M. Lincoln station, 1 mile. *See also Advt., p. 101*

**Liverpool.**—*Shaftesbury House*, Formby, near Liverpool and Southport. Res. Phys., C. J. Tisdall, M.B., Ch.B. Formby,  $\frac{1}{4}$  mile. See also *Advt.*, p. 103

*Tue Brook Villa*, Liverpool, E. Res. Med. Supt., John Murray Moyes, M.B., Ch.B. Tue Brook station,  $\frac{1}{4}$  mile, or Green Lane car. See also *Advt.*, p. 109

**London.**—*Bethlem Royal Hospital*, Monks Orchard, Eden Park, Beckenham, Kent. Phys. Supt., J. G. Porter Phillips, M.D., F.R.C.P. See also *Advt.*, p. 93

*Brooke House*, Clapton, E.5. Res. Med. Supt., Dr. Gerald Johnston. Clapton, L. & N.E.R.

*Camberwell House*, 33, Peckham Road, S.E.5. Senior Phys., H. J. Norman, M.B., Ch.B., D.P.H. See also *Advt.*, p. 102

*Chiswick House*, Moss Lane, Pinner, Middlesex. Res. Med. Supt., Douglas Macaulay, M.D. Pinner station,  $\frac{1}{4}$  mile. See also *Advt.*, p. 92

*Clarence Lodge*, Clapham Park, S.W.4. Res. Licensee, Miss L. Thwaites. Med. Off., Dr. Percy Smith. Clapham Road, and Clapham Common (Electric), 15 minutes. Tel.: 0494 Brixton. See also *Advt.*, p. 104

*Fenstanton*, Christchurch Road, Streatham Hill, S.W. Res. Med. Supt., J. H. Earls, M.D. Tulse Hill, 5 minutes; Streatham Hill, 10 minutes. Tel.: Streatham 8430. See also *Advt.*, p. 108

*Flower House*, Catford, S.E.6. Med. Supt., Wm. F. Umney, M.D. Res. Lic., Mrs. Walter à Beckett. S.R. Beckenham Hill, 5 minutes. See also *Advt.*, p. 107

*Halliford House*, Upper Halliford, Shepperton, S.W. Res. Med. Supt., W. J. H. Haslett, M.R.C.S. Sunbury station,  $\frac{1}{4}$  mile.

*Hayes Park*, Hayes, Middlesex. Res. Med. Off., Dr. H. F. Stilwell. Hayes, 2 miles.

*Hendon Grove Private Mental Home* (ladies only), Hendon, N.W.4. Res. Med. Off. and Licensee, Dr. H. R. S. Walford. Hendon Central (Hampstead Line),  $\frac{1}{4}$  mile.

**LONDON COUNTY COUNCIL Mental Hospitals** (under the direction of the Mental Hospitals Dept., Artillery House, Artillery Row, Victoria Street, S.W.1):—

*Banstead*, near Sutton, Surrey. Res. Med. Supt., A. A. W. Petrie, M.D., F.R.C.S. Belmont station, S.R.,  $\frac{1}{4}$  mile; Sutton station, S.R.,  $1\frac{1}{2}$  miles.

*Bexley*, Kent. Res. Med. Supt., G. Clarke, M.D. Bexley station, S.R.,  $1\frac{1}{2}$  miles.

*Cane Hill*, Coulsdon, Surrey. Res. Med. Supt., G. A. Lilly, M.C., M.A., M.D., D.P.M. Coulsdon South or Coulsdon North, S.R., 10 minutes.

*Claybury*, Woodford Bridge, Essex. Res. Med. Supt., G. F. Barham, M.A., M.D. Woodford station, L. & N.E.R.,  $1\frac{1}{2}$  miles.

*Colney Hatch*, N.11. Res. Med. Supt., J. Brander, M.D., M.R.C.P., D.P.M. New Southgate, L. & N.E.R.

*Ewell*, Epsom. Res. Med. Supt., L. H. Wootton, M.C., B.Sc., M.B., B.S., D.P.M. Epsom, S.R., 2 miles; Ewell, S.R., 1 mile.

*Hanwell*, Southall. Res. Med. Supt., A. W. Daniel, B.A., M.D. Hanwell, G.W.R., 1 mile.

*Horton*, Epsom. Res. Med. Supt., W. D. Nicol, M.B., B.S., D.P.M. Epsom, S.R.,  $1\frac{1}{2}$  miles.

*Long Grove*, Epsom. Res. Med. Supt., D. Ogilvy, M.D. Epsom, S.R.,  $1\frac{1}{2}$  miles.

*West Park*, Epsom. Res. Med. Supt., N. Roberts, O.B.E., M.D., D.P.M. Epsom, S.R.,  $1\frac{1}{2}$  miles.

*Maudsley Hospital (L.C.C.)*, Denmark Hill, S.E.5. For cases of incipient mental disorders (voluntary boarders only). Med. Supt., E. Mapother, M.D., F.R.C.S., F.R.C.P. See also *Advt.*, p. 51

*Mead House*, Hayes (for ladies). Med. Licensees, Dr. H. F. Stilwell and Dr. R. J. Stilwell.

*Moorcroft House*, Hillingdon, Uxbridge. 2 miles. Med. Licensees, Dr. R. J. Stilwell and Dr. G. W. B. James. West Drayton station, 2 miles.

*Newlands House*, Tooting Bec Common, S.W.17. Private Mental Hospital for a limited number of ladies and gentlemen. Phys. Supt., Dr. Noel Sergeant. Balham station, 1 mile; Trinity Road Station (Underground),  $\frac{1}{4}$  mile. Motor bus Nos. 49, 49a, 49b, and 19a. See also *Advt.*, p. 107

*Northumberland House*, Green Lanes, N.4. Res. Med. Supt., Frederick Dillon, M.D. Finsbury Park stations (Underground & G.N.),  $\frac{1}{4}$  mile. See also *Advt.*, p. 94

*Otto House*, 44, Sydenham Hill, S.E.26. Lic. Prop., Capt. F. H. Little. Lady Supt., Miss Brodie. West Kensington, 1 mile.

*Peckham House*, 112, Peckham Road, S.E.15. Props., A. H. & H. G. Stocker. Res. Med. Supt., Dr. F. R. King. Peckham Rye station, 10 minutes' walk.

See also *Advt.*, p. 102  
*Springfield Mental Hospital*, Tooting, S.W. 17. Med. Supt., R. Worth, O.B.E., M.B., B.S. Wandsworth Common station, 1 mile.

*The Priory*, Roehampton, S.W.15. Res. Med. Supt., James Chambers, M.D. Barnes station, 10 minutes.

*Tooting Bec Hospital (L.C.C.)*, Tooting Bec Road, S.W.17. For 2313 patients (both sexes). Res. Med. Supt., P. M. Turnbull, M.C., M.B., Ch.B., D.P.M. Balham, S.R., 3 minutes.

*West Ham Mental Hospital*, Goodmayes, Essex. Res. Med. Supt., Dr. James Harvey Cuthbert. Goodmayes, 1 mile.

*Wood End House*, Hayes (ladies). Med. Lic., Dr. R. J. Stilwell and Dr. G. W. B. James. Hayes station, 1 mile; Uxbridge, 3 miles.



**Wyke House**, Isleworth, Middlesex. Res. Phys., G. W. Smith, O.B.E., M.B., Ch.B. Edin. Isleworth and Osterley stations, 1 mile. *See also Advt., p. 102*

**Londonderry**.—*District Asylum*. Res. Med. Supt., John Watson, M.C., M.B., B.Ch. Londonderry, 1 mile.

**Macclesfield**.—*Cheshire County Mental Hospital*, Parkside. Res. Med. Supt., H. Dove Cormac, M.B., M.S., D.P.M. Macclesfield, 1 mile. *See also Advt., p. 108*

**Maidstone**.—*Kent County Mental Hospital*. Res. Med. Supt., A. C. Hancock, M.C., M.B., B.S., D.P.H., D.P.M. Maidstone West, 1½ miles.

**Malling Place**, West Malling, Kent. Res. Med. Supt., Dr. G. H. Adam. Malling station, 1 mile.

**Market Lavington (Wilts)**.—*Fiddington House*. Med. Supt., J. R. Benson, F.R.C.S. Res. Licensee, The Rev. E. Benson. Lavington, G.W.R., 1 mile; Devizes, 6 miles.

**Melrose, N.B.**—*Roxburgh, Berwick, and Selkirk District Asylum*. Res. Med. Supt., Patrick Steele, M.D. Melrose, ¾ mile.

**Melton (Suffolk)**.—*St. Audry's Hospital for Mental Diseases*. Res. Med. Supt., W. Brooks Keith, M.C., M.D. Melton station, 1½ miles; Woodbridge station, 2½ miles.

**Menston (near Leeds)**.—*West Riding Mental Hospital*. Res. Med. Supt., S. Edgerley, M.D. Guiseley, L.M. & S., 1 mile.

**Merstham (Surrey)**.—*County Mental Hospital*, Netherne, near Coulsdon. Med. Supt., Dr. P. C. Coombes. Coulsdon station, 2 miles.

**Middlesbro' (Yorks)**.—*St. Luke's Hospital*. Res. Med. Supt., Dr. H. G. Drake-Brockman. Middlesbro', 2 miles.

**Monaghan (Ireland)**.—*Monaghan Mental Hospital*. Res. Med. Supt., Dr. T. P. Conlon. Monaghan, ½ mile.

**Montrose, N.B.**—*The Royal Asylum*. Res. Med. Supt., C. J. Shaw, M.D. Dubton, 1 mile; Montrose, 3 miles.

**Morpeth**.—*Northumberland Mental Hospital*. Res. Med. Supt., Guy R. East, M.D., D.P.H. Morpeth station, 1 mile.

**Mullingar**.—*District Mental Hospital*. Res. Med. Supt., Dr. Laurence Gavin. Mullingar station, 1 mile.

**Newcastle-on-Tyne**.—*City Mental Hospital*, Gosforth. Res. Med. Supt., H. D. MacPhail, M.D. Newcastle, 4 miles.

**Northampton**.—*Berrywood Mental Hospital*. Res. Med. Supt., Dr. F. J. Stuart. L.M. & S. (L. & N.W.) station, 2½ miles; L.M. & S.R. (Mid.), 3 miles.

*St. Andrew's Hospital*, Northampton. Res. Med. Supt., D. F. Rambaut, M.A., M.D. Station, 1 mile. *See also Advt., p. 95*

**Norwich**.—*Bethel Hospital for Mental and Nervous Disorders*. Res. Med. Supt., S. J. Fielding, M.B. Cons. Phys., Saml. J. Barton, M.D. Norwich (Thorpe) station, 1 mile. *See also Advt., p. 97*

*City of Norwich Mental Hospital*, Hellesdon, near Norwich. Res. Phys. and Supt., Dr. David Rice. Hellesdon, 1 mile.

*Heigham Hall Private Mental Hospital*, Norwich. Cons. Phys., Dr. G. Stevens Pope, J.P. Res. Med. Supt., Dr. J. A. Small. Thorpe station, 1½ miles; City station, ½ mile. *See also Advt., p. 100*

*Norfolk County Mental Hospital*, Thorpe, Norwich. Res. Med. Supt., O. G. Connell, M.C., L.R.C.P. & S. Whittingham, 1 mile; Norwich, 2½ miles.

*The Grove*, Old Catton, near Norwich (for ladies). Vis. Phys., S. Barton, M.D. Apply to the Misses McIntock.

**Nottingham**.—*City Mental Hospital*, Mapperley Hill. Res. Med. Supt., G. L. Brunton, M.D. Nottingham, 2 miles.

*Notts. County Mental Hospital*, Radcliffe-on-Trent, near Nottingham. Res. Med. Supt., H. C. Waldo, M.R.C.S., L.R.C.P. Radcliffe-on-Trent, 2 miles.

*The Coppice*, Nottingham. Res. Med. Supt., David Hunter, M.B. (Camb.). L.M. & S.R. station, 2½ miles; L. & N.E.K. station, 1½ miles. *See also Advt., p. 96*

**Omagh (Co. Tyrone)**.—*District Asylum*. Res. Med. Supt., Dr. J. Patrick. Omagh, 2 miles.

**Oxford**.—*County and City Mental Hospital*, Littlemore. Res. Med. Supt., T. S. Good, O.B.E., M.A. (Oxon.), M.R.C.S., L.R.C.P. Littlemore station adjoining.

*The Warneford*, Oxford, 1½ miles. Res. Med. Supt., Alex. W. Neill, M.D. Oxford station, 2½ miles. *See also Advt., p. 98*

**Paisley**.—*Craw Road Asylum*. Res. Med. Off., Miss Margaret Hamilton, M.B., Ch.B., D.P.H. Paisley, 1 mile.

*The Mental Hospital*, Riccarton, Paisley. Res. Med. Supt., Mary R. Knight, M.A., M.B., Ch.B. Paisley West, ¼ mile.

*Renfrew District Asylum*, Dykebar, Paisley. Res. Med. Supt., R. D. Hotchkiss, M.D. Paisley, 2½ miles.

**Perth**.—*District Asylum*, Murthly. Res. Med. Supt., Lewis C. Bruce, M.C., M.D. Murthly station adjoins the Asylum.

*James Murray's Royal Mental Hospital*, Perth (for patients of the middle and upper classes). Phys. Supt., W. D. Chambers, M.A., M.D., F.R.C.P.E. Perth station, under 2 miles.

**Plympton**.—*Plympton House*, Plympton, Devon. Res. Prop., Dr. J. C. Nixon. Plympton, 1 mile; Marsh Mills, 2 miles; Plymouth, 5 miles. *See also Advt., p. 106*

**Portlaoighise (Queen's County)**.—*District Mental Hospital*. Res. Med. Supt., Dr. Pierce Grace. Portlaoighise, ½ mile.

**Portsmouth.**—*City Mental Hospital.* Res. Med. Supt., Thomas Beaton, O.B.E., M.D., B.S. (Lond.), F.R.C.P. Clerk and Steward, John C. Kersey. Fratton,  $\frac{1}{2}$  miles. See also Advt., p. 101

**Prestwich (near Manchester).**—*County Mental Hospital.* Res. Med. Supt., Dr. D. Blair. Prestwich,  $\frac{3}{4}$  mile.

**Rainhill (nr. Liverpool).**—*County Mental Hospital.* Res. Med. Supt., Dr. E. F. Reeve. St. Helens,  $2\frac{1}{2}$  miles; Rainhill, 1 mile.

**Rotherham (Yorkshire).**—*The Grange*, 5 miles from Sheffield (for Ladies). Res. Phys., G. E. Mould, M.R.C.S., L.R.C.P. Grange Lane station, L. & N.E.R.,  $\frac{1}{2}$  mile. See also Advt., p. 103

**St. Albans.**—*Herts. County Mental Hospital*, Hill End. Res. Med. Supt., Dr. W. J. T. Kimber. Hill End station, L. & N.E.R. (G.N. Section), 3 minutes. See also Advt., p. 109

**Napsbury Mental Hospital** (under the Middlesex County Council), near St. Albans, Herts. Res. Med. Supt., Arthur O'Neill, O.B.E., M.R.C.S., L.R.C.P. Napsbury, L.M. & S.R., 5 minutes' walk.

**St. Leonards-on-Sea.**—*Ashbrook Hall*, Hollington (for ladies). Res. Lies., Mr. and Mrs. Charles E. H. Somerset. Warrior Square station, 2 miles.

**Salisbury.**—*Laverstock House*, Salisbury. Res. Med. Supt., J. R. Benson, F.R.C.S., L.R.C.P. Salisbury,  $\frac{1}{2}$  miles. See also Advt., p. 92

*Old Manor Mental Hospital*, Salisbury. Res. Med. Supt., Dr. S. E. Martin. Salisbury station, S.R. and G.W.R., 5 minutes. See also Advt., p. 104

**Shrewsbury.**—*Salop Mental Hospital*, Bicton Heath. Res. Med. Supt., W. S. Hughes, M.B., B.S. Shrewsbury,  $2\frac{1}{2}$  miles.

**Slæford.**—*Kesteven Mental Hospital.* Res. Med. Supt., N. K. Henderson, B.A., LL.B., M.B., Ch.B., D.P.H., D.P.M. Raucoby, L. & N.E.R.,  $\frac{1}{4}$  mile.

**Sligo.**—*District Mental Hospital.* Res. Med. Supt., Dr. John Dunne. Sligo,  $\frac{1}{2}$  miles.

**Stafford.**—*County Mental Hospital.* Res. Med. Supt., B. H. Shaw, M.D. Stafford, 1 mile.

*Coton Hill Mental Hospital*, Stafford. Res. Med. Supt., R. MacDonald, M.D., D.P.M. Stafford, 1 mile.

See also Advt., p. 105

**Stirling.**—*District Mental Hospital*, Larch. Res. Med. Supt., R. B. Campbell, M.D. Larch, L.M. & S.R.,  $\frac{1}{2}$  miles.

**Stone (near Aylesbury).**—*Bucks Mental Hospital.* Res. Med. Supt., H. Kerr, M.D. Aylesbury,  $3\frac{1}{4}$  miles.

**Talgarth.**—*Mid-Wales Counties Mental Hospital.* Res. Med. Supt., Dr. P. Drummond. Talgarth, 1 mile.

**Tamworth (Staffs).**—*The Moat House* (for ladies). Res. Medical Attendant, Dr. W. Lowson. Tamworth station,  $\frac{3}{4}$  mile.

**Taunton.**—*Somerset & Bath Mental Hospital*, Cotford, near Taunton. Res. Med. Supt., Dr. H. T. S. Aveline. Norton Fitzwarren station, 2 miles.

**Ticehurst (Sussex).**—*Ticehurst House.* Res. Med. Supt., C. F. F. McDowall, M.D. Wadhurst, 4 miles, or Ticehurst Rd., 3 miles.

**Virginia Water.**—*Holloway Sanatorium*, Hospital for the Insane, St. Ann's Heath. Res. Med. Supt., Henry Devine, O.B.E., M.D., B.S., F.R.C.P. Asst. Med. Offs., Thomas E. Harper, M.R.C.S. (Eng.), L.R.C.P. (Lond.), Cecil Rutherford, B.A., M.B., B.Ch., B.A.O., John G. Hamilton, D.P.M., M.B., B.S. (Lond.), M.R.C.S. (Eng.), L.R.C.P. (Lond.), Eileen Annie Chennell, D.P.M., M.R.C.S. (Eng.), L.R.C.P. (Lond.). Virginia Water station, 5 minutes. Seaside Branch, St. Ann's, Canford Cliffs, Bournemouth. Med. Off., C. G. Cowie, M.D.

See also Advt., p. 99

**Wadsley (near Sheffield).**—*South Yorkshire Mental Hospital.* Res. Med. Supt., W. J. N. Vincent, M.D. Wadsley Bridge, 1 mile (goods); Sheffield, 4 miles (passengers).

**Wakefield.**—*West Riding Mental Hospital.* Res. Med. Supt., Prof. J. Shaw Bolton, M.D. Kirkgate and Westgate stations, 1 mile.

**Wallingford (Berks).**—*Berkshire Mental Hospital.* Res. Med. Supt., Dr. Walter Woolfe Read. Cholsey, 1 mile.

**Warlingham (Surrey).**—*Croydon Mental Hospital.* Res. Med. Supt., H. M. Berncastle, M.R.C.S., L.R.C.P. Upper Warlingham,  $3\frac{1}{2}$  miles.

**Warrington (Lancs).**—*Lancashire County Mental Hospital*, Warrick. Res. Med. Supt., F. M. Rodgers, O.B.E., M.D., D.P.H. Warrington,  $2\frac{1}{2}$  miles.

**Waterford.**—*Bon Sauveur Mental Home*, Carriglen, Dungarvan, Co. Waterford. (For ladies.) Conducted by the Order of Bon Sauveur. Vis. Phys., Dr. D. T. McCarthy. Dungarvan station,  $3\frac{1}{2}$  miles.

*District Mental Hospital*, Waterford. Res. Med. Supt., Dr. Alexis FitzGerald. G.S. & W.R., North station, 2 miles.

*St. Patrick's Private Mental Hospital*, Belmont Park, Waterford. (For gentlemen.) Conducted by the Brothers of Charity. Superior, Rev. Bro. Regulus Bourke. Vis. Phys., Dr. M. Coghlan. Waterford station, 1 mile.

**Wells.**—*The Mental Hospital*, Wells, Som. Res. Med. Supt., Dr. J. McGarvey. Wells station, S. & D.J.R. and G.W.R.,  $1\frac{1}{2}$  miles.

**Whittingham (near Preston).**—*County Mental Hospital*. Res. Med. Supt., Dr. A. R. Grant. Preston, 7 miles.

**Winchelsea (Sussex).**—*Peritane House*, near Hastings (for ladies). Physician, Harvey Baird, M.D. Winchelsea station, 1 mile.

**Woking (Surrey).**—*County Mental Hospital*, Brookwood. Res. Med. Supt., J. A. Lowry, M.D. Brookwood station, 1½ miles.

**Worcester.**—*County & City Mental Hospital*, Powick. Res. Med. Supt., Dr. H. F. Fenton. Worcester station, 4 miles.

**York.**—*Bootham Park Registered Hospital*, York. Res. Med. Supt., G. R. Jeffrey, M.D. York station, 1 mile.

*See also Advt., p. 109*

*The Friends' Retreat*, York. Res. Med. Supt., Dr. Neil Macleod. York station, 1½ miles. *See also Advt., p. 71*

*The Pleasance*, York (ladies only). Phys. Supt. and Res. Licensee, L. D. H. Baugh, M.B. York, 1½ miles.

*North Riding of Yorkshire Mental Hospital*, Clifton, York. Res. Med. Supt., Dr. J. I. Russell. York, 2 miles.

*York City Mental Hospital*, Fulford, York. Res. Med. Supt., Dr. R. A. Hooper. Naburn, L. & N.E.R., 1 mile.

## MENTAL DEFICIENCY ACT, 1913:

### CERTIFIED INSTITUTIONS AND HOUSES.

*Class A.*—Certified Institutions. *Class B.*—Institutions approved under Section 37.

*Class C.*—Certified Houses. *Class D.*—Approved Homes.

#### BERKSHIRE.

*Cumnor Rise, Oxford.*—34 females. High-grade feeble-minded. Managers, Committee. Supt., Mrs. Bliss. (*Class A.*)

#### BUCKINGHAMSHIRE.

*The Manor House Institution, Aylesbury.* For 99 of both sexes. Supt., Miss E. Boughton. Managers, Bucks Mental Deficiency Committee. (*Class A.*)

*Winslow Institution, Winslow.*—9 male, 33 female, adults. Feeble-minded and imbecile. (*Class B.*)

#### CARMARTHENSHIRE.

*Pantglass Hall, Llanfynydd Road, Carmarthen.* For 90 females. Supt., Miss M. Treharne Jones. (*Class A.*)

#### CHESHIRE.

*Ashton House, 26, Village Road, Oxtou, Birkenhead.* For 40 females (high grade). Lady Supt., Miss O. M. Wilkinson. (*Class A.*)

*Sandlebridge, near Alderley Edge.*—378 males and females. Educable mentally defective children under 13 years of age. Managers, Incorporated Lancashire and Cheshire Society for the Permanent Care of the Feeble-minded. Sec., E. M. Richards, 72, Bridge Street, Manchester. (*Class A.*)

#### CUMBERLAND.

*Durran Hill House, Carlisle.*—65 females. Feeble-minded. Higher grade. Apply, Superintendent. (*Class A.*)

#### DERBYSHIRE.

*Thornhill, Trowels Lane, Derby.*—For females. Supt., Miss S. McGarvie.

*Whittington Hall, Whittington, near Chesterfield.*—400 females. Managers, The Incorporation of National Institutions for Persons requiring Care and Control, 14, Howick Place, Victoria Street, S.W.1. (*Class A.*)

#### DEVON.

*Royal Western Counties Institution, Starcross.*—635 males and females (trainable children). Sec. Supt., C. W. Mayer. (*Class A.*)

*Stoke Lyne, Withycombe, Exmouth.*—50 males. Managers, Devon County Council. Supt., Miss H. E. Darlington. (*Class A.*)

#### DURHAM.

*Monkton Hall Home for Lads, Jarrow-on-Tyne.*—79 males. Supt., A. H. Piggott. (*Class A.*)

*Shotley Bridge Colony, Shotley Bridge, Durham.*—206 males, 167 females. Matron, Miss H. L. C. Yates. (*Class A.*)

#### ESSEX.

*Bigods Hall, R. C. Special School, near Dunmow.*—61 high-grade boys. Corresponding Manager, Rt. Rev. Mgr. Wm. O'Grady, St. George's, Walthamstow, E.17. (*Class A.*)

*Brunswick House, Mistley.*—For 75 males (London cases only). Managers, L.C.C. Mental Hospitals Committee. Res. Supt., S. E. Dudley. (*Class A.*)

*Eltou House, Church Road, Leyton.*—102 high-grade feeble-minded females, over 16. Corresponding Manager, as for Bigods Hall. (*Class A.*)

*Royal Eastern Counties Institution Ltd., Colchester.*—1430 males and females, all grades. Managers, The Board of Directors. Address communications to the Medical Superintendent. (*Class A.*)

*The Mutual Sanatorium, Billericay.*—54 males of the middle class. Supt. Sec., Mr. A. J. Read. The Mutual Sanatoria Ltd. (*Class A.*)

*Walsham How Home, 1, Forest Rise, Walthamstow, E.17.* Hon. Sec., Mrs. Cannon, Church Army, 57, Bryanston Street, W.1. For 45 females. Lady Supt., Miss Stephens. (*Class A.*)

## GLAMORGANSHIRE.

*Hensol Castle, near Pontycken, Glam.*  
For 100 males. *Drymma Hall, Skewen, near Neath.* For 79 females. Med. Supt., Dr. E. Lewis. (Class A.)

## GLOUCESTERSHIRE.

*Brentry Colony, Westbury-on-Trym, Bristol.*—327 males over 17 years of age. Med. Supt., Dr. G. de M. Rudolf. Clifton Down or Henbury stations,  $1\frac{1}{2}$  miles. (Class A.)

*Royal Fort Home, St. Michael's Hill, Bristol.*—30 females, high-grade mentally deficient. Managers, Ladies' Committee. Hon. Sec., Mrs. Brown, "Trecarrel," Rylestone Grove, Parry's Lane, Bristol. (Class A.)

*St. Mary's Home, Painswick, near Stroud.*—29 females. High-grade feeble-minded. Apply, Lady Supt. (Class A.)

*Stoke Park Colony, Hanham Hall, Hanham, near Bristol.*—240 males. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.)

*Stoke Park Colony, Royal Victoria Home, Horfield.*—42 females. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.)

*Stoke Park Colony, Stapleton, Bristol.*—790 patients of both sexes (not exceeding 650 females or 300 males). Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.) See also *Advt.*, p. 72

*Stoke Park Colony, West Side, Stapleton.*—308 males. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.)

*Stapleton Institution, Bristol.*—120 adult males, 140 females and 40 children. Superintendent, A. F. Waters. (Class B.)

## HAMPSHIRE.

*Coldest Colony, Salisbury, near Southampton.* For 110, both sexes. Med. Supt., Dr. A. Wilson. (Class A.)

*Mount Tabor, Basingstoke, Hants.*—Church of England institution for 50 high-grade females over 16 years of age. Supt., The Mother Superior, Sisters of the Transfiguration. (Class A.)

*St. Mary's Home, Alton.*—45 mentally and morally deficient females. Managers, The Wantage Community of Sisters. Supt., The Sister Superior. (Class A.)

## HERTS.

*Hillside Special School for Mentally Defective Boys, Buntingford.*—48 males under 16. Secretary, Westminster Diocesan Education Fund, Archbishop's House, Westminster, S.W.1. (Class A.)

*St. Elizabeth's Home for Epileptics, Much Hadham.*—56 males and females. Apply to Secretary, Westminster Diocesan Education Fund, Archbishop's House, Westminster, S.W.1. (Class A.)

*St. Raphael's Colony, Barvin Park, near Potter's Bar, Herts.*—43 males over 16. Secretary, Westminster Diocesan Education Fund, Archbishop's House, Westminster, S.W.1. (Class A.)

*Rowley Lodge, Rowley Green, Barnet.*—Educational home for 14 very backward boys and girls. Principal, Miss Wall. (Class A.)

*The Middlesex Colony for Mental Defectives, Harper Lane, Shenley, near St. Albans.*—285 males. Managers, Middlesex County Council. Med. Supt., Dr. H. E. Beasley. (Class A.)

*Leavesden Mental Hospital, Abbot's Langley, Watford, Herts.*—For 2159 cases (both sexes). Managers, L.C.C. Mental Hospitals Committee. Res. Med. Supt., R. M. Stewart, M.D., D.P.M. (Class B.)

*Boxmoor House School, Boxmoor, Herts.*—10 males under 14, and 10 females. Principals, Misses J. M. and M. D. Isbister. (Class C.)

## KENT.

*Princess Christian's Farm Colony, Hildenborough.*—89 males, 68 females. Managers, National Association for the Feeble-minded. Superintendent, Miss Pitman. (Classes A and D.)

*Darenth Training Colony, near Dartford, Kent.*—For 2260 cases (both sexes). Managers, L.C.C. Mental Hospitals Committee. Res. Med. Supt., J. K. C. Laing, M.B., B.S., D.P.M. (Class B.)

## LANCASHIRE.

*Allerton Priory R.C. Special Industrial School, Woolton, Liverpool.*—123 female educable children. Cor. Manager, Rt. Rev. Mgr. Canon Pinnington. Supt., Sister A. Pound. (Class A.)

*Calderstones, Whalley, near Blackburn.*—1214 males, 1472 females. Feeble-minded, imbeciles, idiots, and moral defectives. Managers, Mental Deficiency Acts Committee, Lancashire Mental Hospitals Board, Preston. (Class A.)

*Dovecot Certified Institution, Knotty Ash, Liverpool.* For 65 females. Supt., Miss F. Eyre. (Class A.)

*Portville R.C. Special School, Ormskirk.*—121 boys under 16. Mentally defective. Cor. Manager, Rt. Rev. Mgr. Canon Pinnington, 109, Great Mersey Street, Liverpool. (Class A.)

*Royal Albert Institution, Lancaster.*—800 of both sexes. Managers, The Central Committee of the Royal Albert Institution, Lancaster. Secretary, Samuel Keir. (Class A.) See also *Advt.*, p. 72

*Seafeld House, Waterloo Road, Seaforth, near Liverpool.*—101 male, 134 female feeble-minded children. Managers, Public Assistance Committee, Liverpool. (Class B.)

## LEICESTERSHIRE.

*Leicester Frith, Groby Road, Leicester* (with ancillary premises at *Birstall Holt, Birstall Lane, Leicester*).—120 males, 157 females. Supt., Miss N. Russam. Managers, City of Leicester Mental Deficiency Committee, Alliance Chambers, Horsefair Street, Leicester. (Class A.)

## LONDON.

*South Side Home, Streatham Common, S.W.16.* For 80 females (London cases only). Managers, L.C.C. Mental Hospitals Committee. Res. Supt., Miss H. G. Holler. (Class A.)

*The Helping Hand Home, 16, Cathcart Hill, N.*—29 females. High-grade mental deficient. Managers, Committee; Hon. Sec., Mrs. Geoffrey Russell, J.P., 17, Church Row, Hampstead, N.W.3. (Class A.)

*St. Teresa's, 97, Belmont Hill, Lewisham.* For females. Supt., Sister A. Friel. (Class A.)

*Fountain Mental Hospital, Tooting Grove, Tooting Craveney, S.W.17.* For 670 low-grade unimprovable children (both sexes). Managers, L.C.C. Mental Hospitals Committee. Res. Med. Supt., J. Nicoll, M.D. (Class B.)

## MIDDLESEX.

*All Souls' Special School, Pield Heath House, Hillingdon.*—120 educable females under 16. Secretary, Westminster Diocesan Education Fund, Archbishop's House, Westminster, S.W.1. (Class A.)

*Bramley House, Clay Hill, Enfield.*—50 females. Managers, Middlesex County Council. Supt., Miss A. Swift. (Class A.)

*Crathorne, Oak Lane, East Finchley, N.*—18 women, 10 children. Hon. Sec., Mrs. Cannon, Church Army, 57, Bryanston Street, W.1. (Class A.)

*Normansfield, Teddington.*—150 males and females of all ages. Med. Supt., Dr. R. L. Langdon-Down. (Class C.)

See also *Advt.*, p. 74

*Alexander House, 117, High Street, Uxbridge.*—24 females over 16. Supt., Miss E. Collyer. (Class D.)

*Conifers, Teddington.*—22 females, and 3 male children. Med. Supt., Dr. R. L. Langdon-Down. (Class D.)

*Trematon, Teddington.*—24 males. Med. Supt., Dr. R. L. Langdon-Down. (Class D.)

## NORFOLK.

*The Lodge, Bowthorpe Road, Norwich.*—6 adult males, 20 adult females. Managers, The Corporation of Norwich. Supt., F. R. Smith. (Class B.)

## NOTTINGHAMSHIRE.

*Rampton State Institution, near Retford.*—Both sexes of violent and dangerous propensities. 652 males, 499 females. Med. Supt., W. R. Thomas, M.D. Managers, The Board of Control, Caxton House West, Tothill Street, S.W.1. (Class A.)

## SOMERSET.

*House of Help (Bath Prevention Mission), 112, Walcot Street, Bath.*—66 feeble-minded fallen females. Supt., Miss H. D. Stegeman. (Class A.)

*Stoke Park Colony, Leigh Court, Abbot's Leigh, nr. Bristol.*—260 females. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.)

*Rock Hall House, Combe Down, Bath.*—18 males, 20 females. Supt., Miss L. S. Davison. (Class A.)

*Yatton Hall, Yatton, near Bristol.*—76 of both sexes under 16 years. Managers, Somerset County Council. Supt., Miss J. McGill. (Class A.)

*Sandhill Park, Bishop's Lydeard.*—101 females and 60 males, of 16 years and over. Managers, Somerset County Council. Supt., Miss T. Wood.

*West End House, Shepton Mallet.*—91 females of 16 years and over. Managers, Somerset County Council.

*Cambridge House, Long Ashton, Bristol.*—30 females and 66 males of 16 years and over. Managers, Somerset County Council. (Class B.)

## STAFFORDSHIRE.

*New Cross Institution, Mental Ward, Wolverhampton.*—5 males, 3 females. Managers, County Borough Council of Wolverhampton. Supt., T. D. Rollinson. (Class B.)

*Sedgley Poor Law Institution, Burton House, Dudley, Stafford.*—50 males, 65 females. Managers, Staffordshire County Council. Master, P. Hopkin. (Class B.)

*Stallington Hall, Blythe Bridge, Stoke-on-Trent.* 33 males, 44 females. Supt., Miss M. A. Cahill. (Class A.)

## STIRLINGSHIRE.

*The Royal Scottish National Institution, Larbert.* For 560 pupils of both sexes and all grades. Res. Med. Supt., R. D. Clarkson, M.D., F.R.C.P. Edin. (Classes A and C.) See also *Advt.*, p. 74

## SUFFOLK.

*Handford Home, Ranelagh Road, Ipswich.*—22 high-grade females. Managers, Ipswich Corporation. Supt., Miss D. B. Miller. (Class A.)

*St. Joseph's Home, The Croft, Sudbury.*—27 high-grade females. Lady Supt., Sister Catherine. (Class A.)

## SURREY.

*Eagle House, London Road, Mitcham.* For females. Supt., Miss M. Blandford. (Class A.)

*Ellen Terry National Home for Blind Defective Children, Wray Park Road, Reigate.* For both sexes. Supt., Miss E. M. Cooke.

*Farmfield, Horley.*—133 males of criminal experience or intractable disposition (London cases only). Managers, L.C.C. Mental Hospitals Committee. Res. Supt., A. J. Oldfield. (Class A.)

*Royal Earlswood Institution, Redhill.*—350 males, 180 females. Med. Supt., Dr. S. Langton. Sec., Mr. H. Stephens, 14, Ludgate Hill, E.C.4. (Class A.)

See also *Advt.*, p. 74

*The Manor, Epsom.*—608 males, 663 females. (London cases only). Managers, L.C.C. Mental Hospitals Committee. Res. Med. Supt., E. S. Litteljohn, M.R.C.S., L.R.C.P. (Class A.)

*Caterham Mental Hospital, Surrey.*—For 2103 cases (both sexes). Managers, L.C.C. Mental Hospitals Committee. Res. Med. Supt., T. Lindsay, M.D., F.R.C.S., D.P.M. (Class B.)

#### SUSSEX.

*The Hermitage Training Home, Fairwarp, near Uckfield.* For females. Supt., Miss M. Walton. (Class A.)

*Tubwell Farm, Jarvis Brook, near Crowborough.* For males only. Supts., Mr. and Mrs. A. Spicer.

#### WARWICK.

*Agatha Stacey Home, Rednal, near Birmingham.*—40 females. The Managers, 158, Broad St., Birmingham. (Class A.)

*Midland Counties Institution, Knowle, near Birmingham.*—180 males. Supt., S. H. Thornton. Med. Officer, J. O. Hollick, M.B. (Class A.)

*Warwick State Institution, The Cape, Warwick.*—Females only. Supt., Mrs. G. E. Newsome. (Class A.)

#### WILTS.

*Devizes Poor Law Institution.*—17 females, 32 males. Managers, Devizes Area Guardians Committee. (Class B.)

*Poor Law Institution, Semington, near Trowbridge.* 22 males, 36 females. Managers, Trowbridge Area Guardians Committee. Supt., C. H. Taylor. (Class B.)

#### WORCESTERSHIRE.

*Besford Court Catholic Mental Welfare Hospital for Children, Besford, near Defford.*—For 200 seniors, 120 juniors. Res. Manager, The Right Rev. Monsignor T. A. Newsome. (Class A.)

#### YORKSHIRE.

*The Kepstern Institution, Kirkstall, Leeds.*—40 adult females. Managers, Leeds City Council. Executive Officer, Mr. S. Wormald, 38, Park Square, Leeds. Matron, Miss A. Riley. (Class A.)

*Meanwood Park Colony, Meanwood, Leeds.* 139 males, 110 females. Managers, Leeds City Council. Executive Officer, Mr. S. Wormald, 38, Park Square, Leeds. Matron, Miss C. Surtees Wilson. (Class A.)

*Mid-Yorkshire Institution, Whitley, York.*—200 males. Managers, The Mid-Yorkshire Joint Board. Supt., Capt. J. Brown, I.S.O. (Class A.)

## INSTITUTIONS AND HOMES FOR INEBRIATES.

LICENSED UNDER THE ACTS, 1879-1900.

The patient must sign a Form expressing a wish to enter the Home, before a magistrate. This can be done at the private residence of the patient, or at the retreat, if previous notice has been given. Two friends must also sign a declaration that they consider the patient an 'Inebriate' within the meaning of the Acts.

\*NOTE—Ecclesfield, Ashford, is a Roman Catholic Religious Institution.

#### MALES ONLY.

*Nuneaton (Warw.).*—*Caldecote Hall* (C.E.T.S. Institution). Res. Med. Supt., Alfred E. Carver, M.D. Nuneaton, 2½ miles. See also *Advt.*, p. 77

*Rickmansworth (Herts.).*—*Dalrymple House.* Apply to Res. Med. Supt., Dr. F. S. D. Hogg. Rickmansworth station, Joint G.C. & Metropolitan Rly., ½ mile; L.M. & S.R., 1 mile. See also *Advt.*, p. 76

#### FEMALES ONLY.

*Ashford (Middlesex).\**—*Ecclesfield.* Med. Supt., Dr. J. Scott. Apply, Mother Superior. Ashford station, 1 mile.

*Belfast.*—*The Lodge Retreat, Dundela Avenue, Holywood Road.* Med. Attend., Muriel Price, M.D. Matron, Miss R. Clarke. All stations 20 to 30 minutes by tram.

*Beverley (E. Yorks.).*—*Albion House.* Med. Supt., H. L. Munro, M.D. Hon. Sec., Mrs. T. R. Pentith, Red Roofs, Sutton, near Hull. Beverley, 1 mile.

*Thorpe, near Chertsey.*—*Spelthorne St. Mary.* Apply to the Sister Superior, C.S.M.V. Med. Supt., Dr. W. Dale. Virginia Water, 1½ miles.

## UNLICENSED HOMES.

**Beckenham (Kent).**—*Norwood Sanatorium Ltd.*, The Mansion, Beckenham Park. Beckenham Junction, 10 minutes.  
See also *Advt.*, p. 76

**Chislehurst (Kent).**—*Old Hill House Ltd.* Res. Med. Supt., Walter E. Masters, M.D., M.R.C.S., D.P.H. Chislehurst station, 4 minutes.

**Paignton (Devon).**—*Bay Mount*, small private home for both sexes. Res. Med. Supt., Dr. Stanford Park.

See also *Advt.*, p. 77

**Woodbridge (Suffolk).**—*Norwood Sanatorium Ltd.*, Rendlesham Hall, Woodbridge. Wickham Market station. Telephone and Telegrams: Wickham Market 16.  
See also *Advt.*, p. 76

SANATORIA FOR CONSUMPTION  
AND OTHER FORMS OF TUBERCULOSIS.

**Aberchalder (N.B.).**—*Inverness-shire Sanatorium, Invergarry.* Med. Supt., J. Kirton, M.C., M.A., M.D. Aberchalder, 2 miles.

**Ascot.**—*Farmwood Sanatorium* (for both sexes). Res. Med. Supt., T. H. Hay, M.B., C.M., F.R.C.S.I. Apply, Secretary. Ascot, 1 mile.  
See also *Advt.*, p. 80

**Ashford (Kent).**—*Grosvenor Sanatorium*, Kennington, near Ashford. Res. Med. Supt., J. A. Milne, M.B., Ch.B., D.P.H. Ashford Junction, 2 miles.

**Aysgarth (Yorks).**—*Wensleydale Sanatorium.* Physicians, D. Dunbar, M.B., B.S., and W. N. Pickles, M.D., B.S. Aysgarth,  $\frac{1}{2}$  mile, via Northallerton, L. & N.E.R., and Hawes Junction, L.M. & S.R.  
See also *Advt.*, p. 82

**Baguley (Cheshire).**—*Baguley Sanatorium.* For Manchester cases. Res. Med. Supt., H. G. Trayer, M.B., D.P.H. Baguley,  $\frac{1}{2}$  miles.

**Barrasford (Northumberland).**—*The Newcastle-on-Tyne Sanatorium.* Res. Med. Supt., Dr. C. G. R. Goodwin. Barrasford, L. & N.E.R., 4 miles.

**Benenden (Kent).**—*Sanatorium of "National Association for the Establishment and Maintenance of Sanatoria for Workers suffering from Tuberculosis."* Res. Med. Supt., Dr. H. Spurrier. Bidenden, 3 miles.

**Bingley (Yorks).**—*Eldwick Sanatorium* (West Riding County Council school for physically children). Med. Off., Dr. Margaret S. Sharp. Bingley station, 2 miles.

**Birmingham.**—*City Sanatorium*, Yardley Road, Small Heath. Res. Med. Supt., Dr. G. B. Dixon. Stechford, L.M. & S.R. *Romsley Hill Sanatorium*, Halesowen, Worcestershire. Res. Med. Supt., Dr. P. J. Bodington. Birmingham Corporation Sanatorium. Halesowen,  $\frac{1}{2}$  miles.

**Bolton (Lancs).**—*Wilkinson Sanatorium for Consumptives*, Sharples. Med. Off., Dr. W. Rolland. Bolton, 2 miles.

**Boston (Lincs).**—*Holland Sanatorium.* Med. Supt., H. C. Jennings, M.B., D.P.H. Boston, 1 mile.

**Bournemouth.**—*Royal National Sanatorium for Consumption and Diseases of Chest.* Sec., A. G. A. Major. Res. Med. Off., D. A. Hutcheson, M.D. Bournemouth Central,  $1\frac{1}{2}$  miles; Bournemouth West,  $\frac{1}{2}$  mile.

*The Firs Home* (for advanced cases of consumption). Hon. Sec., Col. R. F. Anderson. Hon. Treas., A. J. Drewe, Esq. Hon. Med. Offs., C. P. Woodstock, M.D., and S. G. Champion, M.D. Lady Supt., Miss Ingram. Bournemouth Central,  $\frac{1}{2}$  mile.

**Bovey Tracey (Devon).**—*Devon County Sanatorium*, Hawkmoor. Res. Med. Supt., Dr. J. C. Smyth. Bovey, 3 miles; Lustleigh, 2 miles.

**Bradford.**—*Bierley Hall Sanatorium*, Bierley Lane. For 60 men and women. Res. Med. Supt., Dr. L. G. White. Bradford, 3 miles.

**Bridge of Weir (Renfrewshire).**—*Consumption Sanatoria of Scotland.* Hon. Treas., Lord Macleay, 21, Bothwell Street, Glasgow. Res. Med. Supt., E. J. Peill, M.B., Ch.B., F.R.C.S.E. Bridge of Weir, 2 miles.

**Brighton.**—*Municipal Sanatorium*, for Brighton townfolk only (pulmonary and joints). Med. Supt., Dr. Duncan Forbes, M.O.H., Royal York Buildings, Brighton. Brighton Central station,  $1\frac{1}{2}$  miles.

**Bristol.**—*Frenchay Park Sanatorium for Bristol Children*, Frenchay, near Bristol. Res. Med. Supt., Dr. K. H. Priddy. Under the control of the M.O.H. Dept., Bristol. Staple Hill station, L.M. & S.R.,  $1\frac{1}{2}$  miles.

**Buttevant (Co. Cork).**—*Cork County and City Sanatorium*, Heatherside. Res. Med. Supt., Dr. R. Ahern. Buttevant, G.S. & W.R., 6 miles.

**Camberley (Surrey).**—*Prior Place Sanatorium*, Heatherside. Res. Med. Supt., Dr. H. O. Blanford.

**Camborne (Cornwall).**—*Tekidy Sanatorium*. Res. Med. Supt., Dr. F. Chown. Camborne, 3 miles.

**Cambridge.**—*Papworth Village Settlement*. Med. Director, Sir Pendrill Varrier-Jones, M.A., M.R.C.P. Huntingdon station, 6 miles; Cambridge, 12 miles.

**Chagford (Devon).**—*Dartmoor Convalescent Home*. Res. Med. Supt., Dr. C. H. Berry. Moretonhampstead, G.W.R., 6 miles.

**Chandler's Ford (Hants).**—*Hants County Council Sanatorium*. Res. Med. Supt., Dr. W. J. Hart. Chandler's Ford, 1 mile.

**Cheltenham.**—*The Cotswold Sanatorium*, Cranham, Gloucester. Res. Med. Phys., Geoffrey A. Hoffman, B.A., M.B., T.C. (Dub.), and Margaret A. Harrison, M.B., B.S. (Lond.). Cheltenham, Gloucester, or Stroud, all 8 miles. See also *Advt.*, p. 78

*Salterley Grange Sanatorium*, near Cheltenham. Res. Med. Supt., Dr. D. J. Peebles. Leckhampton, 2½ miles; Cheltenham, 3½ miles.

**Conway, North Wales.**—*The Dr. Garrett Memorial Home*, Morfa Drive. For boys and girls. 200 beds (86 open-air). Proprietress, C. E. M. Garrett.

**Darlington.**—*Felix House*, Middleton St. George, Co. Durham. Res. Med. Supt., C. S. Steavenson, M.B. Dinsdale, N.E.R., 3 minutes.

**Davos-Platz (Switzerland).**—*Park Sanatorium* (formerly *Sanatorium Turban*), Davos-Platz. Res. Med. Supt., F. Bauer, M.D. Davos-Platz, 10 minutes.

See also *Advt.*, p. 85

"*The Victoria*," *British Sanatorium*, Davos-Platz (Grisons). Res. Med. Supt., Bernard Hudson, M.D., M.R.C.P.

See also *Advt.*, p. 85

**Derbyshire.**—*Derbyshire County Sanatorium*, Walton, near Chesterfield. Med. Supt., A. N. Robertson, M.D. Chesterfield, 1½ miles.

**Devon and Cornwall Sanatorium**, Didworthy, South Brent. For consumptives of the two counties. Sec., S. Carlile Davis, Esq., M.B.E., 5, Princess Square, Plymouth. Res. Med. Off., Dr. A. T. Bettinson. Brent, G.W.R., 2 miles.

**Dublin.**—*Peamount Sanatorium*, New-castle, Co. Dublin. Res. Med. Supt., A. Barry, F.R.C.P.I. Lucan, 2 miles.

**Dundee (near).**—*Sidlaw Sanatorium*, Auchterhouse. 80 beds for children. (In connection with Dundee Royal Infirmary. Med. Supt., H. J. C. Gibson, M.D.). Vis. Phys., W. E. Foggie, D.S.O., M.D. Vis. Surg., L. T. Price, F.R.C.S.E. Matron, Miss Ellen Norris. Sec., W. Ferguson. Auchterhouse station, 1½ miles.

**Durham.**—*Durham County Consumption Sanatorium*. Sec., Mr. F. Forrest, 54, John Street, Sunderland. Vis. Med. Supt., Dr. G. S. Robinson. For men and boys: Stanhope. Med. Off., Dr. J. O'Hara. Stanhope station, 1 mile. For women and children: Wolsingham. Med. Off., Dr. J. F. McConchie. Wolsingham station, ¾ mile.

**East Fortune (East Lothian).**—*East Fortune Sanatorium*. Res. Med. Supt., Chas. Cameron, M.D. East Fortune, ½ mile.

**Ecclefechan, by Lockerbie.**—*St. Fechan's Sanatorium*, for boys. Res. Med. Off., Dr. F. A. Collington. Ecclefechan station, 1 mile.

**Fortbreda, Belfast.**—*Forster Green Hospital for Consumption and Chest Diseases*. Med. Supt., B. R. Clarke, M.D. Sec., J. Osborne, 99-103, Scottish Provident Buildings, Belfast. Belfast, 2 miles.

**Frimley (Surrey).**—*Brompton Hospital Sanatorium*. Res. Med. Supt., Dr. R. C. Wingfield. Frimley station, 2 miles.

**Grange-over-Sands.**—*Westmorland Sanatorium*, Meathop. Res. Med. Supt., J. Munro Campbell, M.B., Ch.B., D.P.H. Grange-over-Sands station, 2 miles.

**Gt. Barrow, Chester.**—*East Lancashire Tuberculosis Colony and Sanatorium, Barrowmore Hall*. Occupational treatment. Res. Med. Supt., Dr. E. L. Sandilands. Chester, 6 miles.

**Harpenden (Herts).**—*Sanatorium of the National Children's Home and Orphanage*. Harpenden station, L.M. & S.R. Vis. Phys., T. N. Kelynnack, M.D., J.P. Principal, Rev. W. Hodson Smith, Highbury Park, London, N.6.

**Hastings.**—*Fairlight Sanatorium*, in connection with Margaret Street Hospital for Consumption (for Out-Patients), 26, Margaret St., W. Sec., Mrs. M. C. Hawthorne. Med. Offs., Dr. N. F. Stallard and Dr. C. de W. Kitchat. Hastings, tram, about 15 minutes.

**Heswall (Cheshire).**—*Cleaver Sanatorium for Children*. 200 beds. Med. Supt., J. B. Yeoman, M.D. Matron, Miss D. Kelsall. Heswall, 1½ miles.

**Hexham (Northumberland).**—*Wooley Sanatorium*. Res. Med. Supt., Dr. R. Cunningham. Corbridge, 5 miles.

**Hull.**—*Hull and East Riding Convalescent Home*, Withernsea. Sec., Benjamin Brooks, 87, Victoria Avenue, Hull. Med. Off., Dr. S. F. Fouracre. Withernsea station.

**Huntingdon.**—*Wyton Sanatorium* (Hunts County Council), for women and children. Med. Off., Dr. Moss-Blundell. Huntingdon, 3½ miles.



**Ilkley (Yorks).**—*Middleton Sanatorium*, near Ilkley. Res. Med. Supt., T. Campbell, M.D. Ben Rhydding,  $\frac{1}{2}$  miles.

**Isle of Wight.**—*Hermitage Sanatorium*, Whitwell, near Ventnor. For males only. Med. Supt., Dr. H. F. Bassano.

*Royal National Hospital for Consumption*, Ventnor. Med. Supt., Dr. G. Oliver Hempson. Sec., W. H. Garratt, 18, Buckingham St., Strand, W.C.2. Ventnor, 1 mile. See also Advt., p. 59

**Kingussie (Inverness-shire).**—*Grampian Sanatorium*. Res. Med. Supt., Felix Savy, M.D. Kingussie,  $\frac{3}{4}$  mile. See also Advt., p. 83

**Kirkcaldy**—*Sanatorium for Tuberculosis*. Med. Supt., Dr. G. W. McIntosh. Res. Med. Off., Dr. S. K. Drainer. Sec., The Town Clerk. Kirkcaldy, 1 mile.

**Leeds.**—*Gateforth Sanatorium*, near Solby. Res. Med. Supt., Dr. A. C. Meek. *Leeds Sanatorium for Consumptives*, Killingbeck; and *Children's Sanatorium*, "The Hollies," Westwood, Leeds.

**Leysin-Feydey (Switzerland).**—*Station Climatique de Leysin*: *Sanatorium Grand Hotel* (Dr. Jaquerod), *Sanatorium Mont-Blanc* (Dr. Pignet), *Sanatorium Chamossaire* (Dr. Sillig and Dr. Jeanneret), *Sanatorium Belvédère* (Dr. Gilbert). Leysin-Feydey station, from 1 to 5 minutes. See also Advt., p. 85

**Liverpool.**—*Broadgreen Sanatorium*, Edge Lane Drive, Liverpool. Res. Med. Supt., ——. Broadgreen station,  $\frac{1}{2}$  mile.

*Fazakerley Sanatorium*, Longmoor Lane, Liverpool. Res. Med. Supt., C. Rundle, O.B.E., M.D. Fazakerley station,  $\frac{1}{2}$  mile.

*Liverpool Sanatorium for Consumptives*, Delamere Forest, Frodsham. Sec., W. H. Rayner, Liverpool Hospital for Consumption, Mount Pleasant, Liverpool. Res. Phys., Alfred Adams, M.D. Frodsham or Helsby, L.M. & S.R.,  $3\frac{1}{2}$  miles.

**Llanybyther (Carmarthenshire).**—*West Wales Sanatorium*. The Welsh National Memorial to King Edward VII. Res. Med. Supt., Dr. Henry A. Ross. Llanybyther station, 3 miles.

**London.**—*City of London Hospital for Diseases of the Heart and Lungs*, Victoria Park, E.2. Apply, Secretary.

*Royal Chest Hospital*, 231, City Road, E.C.1 (Section of the Royal Northern Group of Hospitals). Apply, Secretary.

**Manchester.**—*Manchester Hospital for Consumption and Diseases of Throat and Chest*, Hardman Street, Deansgate, Manchester (Out-patients). Act. Sec., W. Hunt. Bowdon, Cheshire (In-patients). Res. Med. Off., Dr. B. P. Robinson. *Crossley Sanatorium*, Delamere, Cheshire. Res. Med. Off., Dr. G. Heathcote. (For poor and working classes, after personal examination at Manchester.)

**Market Drayton (Shropshire).**—*Cheshire Joint Sanatorium*. Res. Med. Supt., Dr. Peter W. Edwards. Market Drayton,  $\frac{4}{5}$  miles.

**Marple (Cheshire).**—*Nab Top Sanatorium*, for residents of Salford only. Med. Supt., H. M. Fleming, M.D. Rosehill (Marple) station,  $\frac{1}{2}$  mile.

**Menai Bridge, Anglesey.**—*Penhysgyn-y-Gors Sanatorium for Children* (King Edward VII Welsh National Memorial Association). Med. Off., Dr. Emrys Jones. Matron, S. J. Bennett. Menai Bridge, 3 miles.

**Mendip Hills.**—*Nordrach-upon-Mendip*, Blagdon, near Bristol. Res. Med. Supt., Cyril Francis Ashby, M.R.C.S., L.R.C.P. Sandford and Banwell station, G.W.R.

See also Advt., p. 81

**Midhurst (Sussex).**—*King Edward VII Sanatorium*. Res. Med. Supt., Dr. R. R. Trail. Midhurst, 4 miles.

**Montana-sur-Sierre (Switzerland).**—*Montana Hall (The British Sanatorium)*. Res. Med. Supt., Hilary Roche, M.D., M.R.C.P. See also Advt., p. 79

**Murtle (Aberdeenshire).**—*Tor-na-Dee Sanatorium*. Res. Med. Supt., Dr. J. M. Johnston. Murtle,  $\frac{1}{2}$  mile.

See also Advt., p. 83

**Nayland (Suffolk).**—*East Anglian Sanatorium* for private patients, *Maltings Farm Sanatorium* for poorer men and women patients, and *East Anglian Children's Sanatorium*, Nayland. Med. Supt., Dr. Jane Walker, C.H., J.P., L.L.D. Bures station, L. & N.E.R.,  $3\frac{1}{2}$  miles; Colchester, 8 miles. See also Advt., p. 82

**New Cumnock (Ayrshire).**—*Ayrshire Sanatorium*, Glenafton. Res. Med. Supt., E. E. Prest, M.D. New Cumnock, 3 miles.

**Norfolk.**—*Children's Sanatorium for the Treatment of Phthisis, Incorporated*, Holt. Vis. Med. Off., Dr. H. F. Skrimshire. Hon. Sec., Mrs. C. Munro, Carnegie House, 117, Piccadilly, W.1.

*Kelling Sanatorium*, Holt. Res. Med. Supt., Dr. J. I. W. Morris. Holt,  $1\frac{1}{2}$  miles.

*Mundesley Sanatorium*, Mundesley. Res. Med. Supts., S. Vere Pearson, M.D., Andrew J. Morland, M.D., and E. C. Wynne-Edwards, M.B. Mundesley, 1 mile. See also Advt., p. 81

**Northampton.**—*Creaton Sanatorium*, Creaton. Res. Med. Supt., Dr. H. Selby. Brixworth, L.M. & S.R., 3 miles.

**Nottinghamshire.**—*Ransom Sanatorium* (Notts County Council), Rainworth, near Mansfield. Res. Med. Off., Dr. R. R. S. Weatherston. Mansfield, 3 miles.

**Oban (Scotland).**—*Argyll County Sanatorium*, Benvoulin. 40 beds. Vis. Med. Off., Duncan MacDonald, M.D. Oban. 1 mile.

**Oldham.**—*Strinesdale Sanatorium*. Med. Supt., Dr. J. B. Wilkinson. Oldham, 2 miles.

**Peebles.**—*Manor Valley Sanatorium*. Med. Off., C. E. Gunn, M.D. Peebles 4 miles; Lyne,  $1\frac{1}{2}$  miles.

**Penmaenmawr (N. Wales).**—*Pendyffryn Hall Sanatorium*. Res. Phys., Dennison Pickering, M.D. (Camb.) and J. A. Hennessy, M.B., Ch.B. Penmaenmawr, L.M. & S.R.,  $1\frac{1}{2}$  miles.

*See also Advt., p. 80*

**Peppard Common (Oxon).**—*Berks and Bucks Joint Sanatorium*. Res. Med. Off. Dr. Esther Carling. Reading,  $6\frac{1}{2}$  miles.

**Ringwood (Hants).**—*Linford Sanatorium*. Res. Med. Supts., A. de W. Snowden, M.D., Dr. A. G. E. Wilcock, and Dr. C. Cassidy. Ringwood, 3 miles.

**Robertsbridge (Sussex).**—*Darvell Hall Sanatorium* (East Sussex County Council). Res. Med. Off., Dr. J. R. Dingley. Robertsbridge, S. Rly.,  $\frac{1}{4}$  mile.

**Rudgwick (Sussex).**—*Rudgwick Sanatorium*. Vis. London Phys., Dr. Annie McCall. Rudgwick station, 7 minutes.

**Ruthin (N. Wales).**—*Vale of Clwyd Sanatorium*, Llanbedr Hall. Res. Med. Supt., H. Morrison Davies, M.D. Ruthin station, 2 miles. *See also Advt., p. 82*

**St. Leonards.**—*Eversfield Chest Hospital*, West Hill. Res. Phys., Dr. E. J. Maxwell. West St. Leonards, S.R.; West Marina, S.R. within 5 minutes' walk.

**Sandon, near Chelmsford (Essex).**—*Merivale Sanatorium*. Res. Med. Supt., H. N. Marrett, M.R.C.S., L.R.C.P. Chelmsford station, L. & N.E.R.,  $3\frac{1}{2}$  miles.

**Sandy (Beds).**—*The Bedfordshire County Sanatorium*, Mogerhanger Park. Med. Supt., C. G. Welch, M.D. Sandy station,  $2\frac{1}{2}$  miles.

**Sheffield.**—*The City Sanatoria*. Crimicar Lane Sanatorium (males); Commonsides Sanatorium (females); Winter Street Sanatorium (both sexes); Nether Edge Sanatorium (both sexes and children). Clinical Tuberculosis Off., H. Midgley Turner, M.D., D.P.H. Sheffield, L.M. & S.R.,  $4\frac{1}{2}$  miles.

**Shirlett, near Broseley (Shropshire).**—*King Edward VII Memorial Sanatorium*. Res. Med. Supt., Dr. F. T. Turner. Much Wenlock station, 3 miles.

**Skipton (Yorks).**—*Eastby Sanatorium for Boys*. Res. Med. Supt., Dr. Catherine Arnott. Embay station, 2 miles.

**Stannington (Northumberland).**—*Children's Sanatorium*. Res. Med. Off., Dr. Elsie F. Farquharson. Med. Supt., T. C. Hunter, M.D. Surgeon, H. M. Johnston, F.R.C.S. Matron, Miss I. Campbell. Stannington station, 2 miles.

**Stonehouse (Glos).**—*Standish House Sanatorium*. Res. Med. Supt., W. A. Dickson, M.D., F.R.C.S. Stonehouse, G.W.R.,  $1\frac{1}{2}$  miles; L.M. & S.R.,  $2\frac{1}{2}$  miles.

**Stourbridge (Worcs).**—*Prestwood Sanatorium*. Med. Supt., Dr. J. Stevenson, M.C. Stourbridge, 3 miles.

**Swansea.**—*Adelina Patti Tuberculosis Hospital*, "Craig-y-nos," Pen-y-cae. Res. Med. Supt., Dr. L. R. Clark. Craig-y-nos, 2 miles.

**Threlkeld (Cumberland).**—*Blencathra Sanatorium*. Res. Med. Supt., Dr. W. Goodchild. Threlkeld, L.M. & S.R., 2 miles. *See also Advt., p. 83*

**Torquay.**—*"Whitecliff" Tuberculosis Hospital*. Med. Supt., Dr. R. H. Robinson. Tuberculosis Off., Dr. E. Ward. Torre station, 2 miles.

**Ulverston.**—*High Carley Sanatorium* (including Oubas House Children's Sanatorium). Res. Med. Supt., G. Leggat, M.B., Ch.B. Ulverston, 2 miles.

**Ware (Herts).**—*Hertfordshire County Sanatorium*, Ware Park. Res. Med. Supt., Herbert Sharpe, M.R.C.S., L.R.C.P. Ware, 2 miles; Hertford, 2 miles.

**Warrenpoint (Co. Down).**—*Rostrevor Sanatorium*. Phys., Dr. J. A. O'Tierney. Apply Secretary.

**Whiteabbey (Co. Antrim).**—*Belfast Municipal Sanatorium*. Res. Med. Supt., P. S. Walker, M.D., B.Ch., D.P.H.

**Wicklow.**—*The Royal National Hospital for Consumption for Ireland*, Newcastle, Wicklow. Res. Med. Off., C. Denys Hanan, M.D. G.S. Rlys. to Newcastle, Co. Wicklow, 3 miles.

**Winsley, near Bath.**—*Winsley Sanatorium*. Res. Med. Off., Dr. J. D. Macfie. Limpley Stoke station, 1 mile.

**Worcester (near).**—*King Edward VII Memorial Sanatorium*, Knightwick. Free to County patients. Res. Med. Supt., Dr. H. Gordon-Smith. Knightwick,  $1\frac{1}{2}$  miles.

## HYDROPATHIC ESTABLISHMENTS.

**Bournemouth (Hampshire).**—*Bournemouth Hydropathic.* Res. Med. Supt., W. J. Smyth, M.D. Bournemouth West station,  $\frac{1}{2}$  mile.

*Durley Dean Hydro,* Bournemouth. Proprietor, C. K. Harper. Bournemouth West, 1 mile.

*Linden Hall Hydro,* Bournemouth. Proprietors, The Exton Hotels Co. Ltd.

**Bristol.**—*The Bristol Hydropathic and Electrotherapeutic Establishment,* College Green. Res. Phys., A. T. Spoor, M.A., M.R.C.S., L.R.C.P. Res. Med. Supt., W. J. Spoor, M.B., M.R.C.S. Temple Meads,  $1\frac{1}{2}$  miles.

**Cork.**—*St. Ann's Hill Hydropathic,* St. Ann's Hill, near Blarney, Co. Cork. Res. Phys., Dr. R. H. Barter. Blarney station, 3 miles.

**Crieff.**—*Strathearn Hydro* (17 miles from Perth). Res. Med. Supt., T. Gordon Meikle, M.B., C.M. Crieff station, 1 mile.

**Forres.**—*Cluny Hill Hydropathic.* Vis. Phys., Dr. John C. Adam. Forres station, 1 mile.

**Harrogate (Yorkshire).**—*Harlow Manor Hydro.* Manageress, Mrs. Baxter. Harrogate station, 1 mile.

*The Cairn Hydro,* Harrogate. Apply, Manager. Harrogate station,  $\frac{1}{2}$  mile.

*The Harrogate Hydropathic Lim.* Med. Supt., Dr. A. Hinsley-Walker. Man., W. Taylor. Harrogate station,  $\frac{1}{2}$  mile.

**Ilkley (Yorkshire).**—*Craiglands Hydro.* Res. Phys., Maurice R. Dobson, O.B.E., M.B., B.S. (Lond.), L.R.C.P., M.R.C.S. (Eng.). See also Advt., p. 86

**Leicester.**—*Leicester Hydro Establishment,* Museum Square, Leicester. See also Advt., p. 86

**Limpley Stoke (near Bath).**—*West of England Hydropathic.* Vis. Med. Supt., Dr. C. N. Vaisey. Apply, the Secretary. Limpley Stoke station (G.W.R.).

**Matlock.**—*Rockside Hydropathic,* Matlock. Two Vis. Physicians. Matlock,  $\frac{1}{2}$  mile. See also Advt., p. 89

*Smedley's Hydropathic,* Matlock. Res. and Vis. Physicians. Matlock station,  $\frac{1}{2}$  mile; omnibus. See also Advt., p. 87

**Peebles.**—*Peebles Hotel Hydropathic.* Med. Supt., Dr. Thomas Martin. L.M.S. and L. & N.E.R. stations, about 10 to 15 minutes' walk. Bus meets all trains.

**Southport (Birkdale Park).**—*Smedley Hydropathic.* Southport or Birkdale stations, 5 minutes.

*Kenworthy's Hydropathic,* Southport. Res. Phys., Dr. I. E. Kenworthy. Chapel Street (L.M. & S.): Lord Street (Cheshire Lines); 3 minutes by taxicab.

## NURSING INSTITUTIONS AND TRAINING INSTITUTIONS FOR NURSES.

**Bristol.**—*Chesterfield Nursing Home,* Queen's Road, Clifton. Apply, Matron. See also Advt., p. 70

**London.**—*Cavendish Temperance Male Nurses' Corporation Lim.,* 54, Beaumont St., W.1; 23, Upper Baggot St., Dublin; 28, Windsor Terr., Glasgow; and 176, Oxford Rd., Manchester. See also Advt., p. 70

*Male Nurses' Association,* 29, York Street, Baker Street, W.1. Sec., W. J. Hicks. See also Advt., p. 69

*New Mental Nurses' Co-operation,* 139, Edgware Road, Marble Arch, W.2.

See also Advt., p. 68

*Norfolk Square Nursing Association and Hyde Park Association of Trained Nurses,* 49, Norfolk Square, W.2. Lady Supt., Miss J. S. Weir. Tel.: Padd. 6533.

See also Advt., p. 71

*The Nurses' Association,* 29 York Street, Baker Street, W.1. Sec., W. J. Hicks; Supt., Mrs. Millicent Hicks.

See also Advt., p. 69

**York.**—*The Retreat, Trained Nurses' Department.* Apply to the Matron.

See also Advt., p. 71

## PRIVATE HOMES FOR INVALIDS, MATERNITY HOMES, AND INSTITUTIONS FOR SPECIAL CARE AND TREATMENT.

**Alderley Edge (Cheshire).**—*The David Lewis Colony* (for sane epileptics), and *Colthurst House School* (for epileptic boys and girls). Res. Director, Alan McDougall, M.D. Alderley Edge, 3 miles.

See also *Advt.*, p. 72

**Bath.**—*Lansdown Hospital and Nursing Home*, Bath. Special arrangements for patients suffering from gout, rheumatism, and physical infirmities. Physician, Dr. Wells-Beville. L.M. & S. or G.W. stations, 1 mile.

See also *Advt.*, p. 68

**Boxhill-on-Sea (Sussex).**—*Home for Rest, Convalescence, and Electrotherapy*. Apply, Miss Rattray, S.R.N., C.S.M.M.G.

See also *Advt.*, p. 70

**Bristol.**—*Dorset House*, Clifton Down. Functional nervous disorder—ladies and girls. Apply, Elizabeth Casson, M.D., D.P.M.

See also *Advt.*, p. xlvii

**Broadstone, Dorset.**—“*Rizwan*” *Nursing Home*, Blandford Road. For T.B. patients. Apply Sister Challis.

See also *Advt.*, p. 81

**Ewell, near Epsom.**—*Ewell Grove Nursing Home*. Nervous and other cases. Res. Med. Supt., J. G. Garson, M.D. Apply, Mrs. Garson. Ewell E. and Ewell W. stations. See also *Advt.*, p. 75

**Great Missenden (Bucks).**—*Woodlands Park*. Rest after operation or illness, cardiac and nervous diseases, or permanent invalids. Res. Phys., C. W. J. Brasher, M.D. Great Missenden, 1½ miles.

See also *Advt.*, p. 65

**Harrow-on-the-Hill.**—*Bowden House* (for functional nervous disorders). Med. Supt., Henry L. Wilson, M.B., M.R.C.P. Sudbury Hill, Harrow, L. & N.E.R., 15 mins. walk.

See also *Advt.*, p. 75

**Hatch End (Middlesex).**—*Oxhey Grove*. For early mental conditions in both sexes. Res. Med. Supt., Dr. Josephine A. Miller. Hatch End station, 1 mile.

See also *Advt.*, p. 75

**King's Langley (Herts).**—*The Archer Nerve Training Colony, Langley Rise, Ltd.* (for functional nervous disorders). Apply Secretary.

See also *Advt.*, p. 75

**Kreuzlingen, Switzerland.**—*Dr. Binswanger's Sanatorium Bellevue*. For nervous and mental complaints.

See also *Advt.*, p. 77

**Liverpool.**—*Home for Epileptics*, Maghull (for sane epileptics), and *Chilton Home*, certified as a special school for 82 epileptic children. Med. Officer, C. V. H. Nesbit, M.D. Sec., C. E. Grisewood, A.C.A., 2, Exchange Street East, Liverpool.

See also *Advt.*, p. 64

**London.**—*Kay Glen Clinic*, 9, Cavendish Square, W.1. Hydrotherapy, Electrotherapy, Massage, etc. Apply, The Principal.

See also *Advt.*, p. 70

*Minerva House*, 12 & 14, Comeragh Road, West Kensington, W.14. Medical, Surgical, Maternity, and Nerve cases. Apply, Miss Purdy. District Rly. station, 3 mins. walk.

See also *Advt.*, p. xxxv

*The Radium Institute*, 10, Riding House Street, W. Sec., Thomas A. Garner, F.C.I.S.

See also *Advt.*, p. 65

*Swedish Institute and Clinique*, 108, Cromwell Road, S.W.7. For Massage, Medical Electricity, and Medical Gymnastics. Gloucester Road (Dist. Met. and Piccadilly Tube), 2 minutes. Phone, West 1010.

See also *Advt.*, p. 71

*Woodside Nerve Hospital*, Woodside Avenue, Muswell Hill, N.10. (St. Luke's Foundation.) For functional nervous disorders. Physician in charge.

See also *Advt.*, p. 73

**Perth.**—*Gilgal Hospital*. For neuropathic and psychopathic disorders. Phys. Supt., W. D. Chambers, M.A., M.D.

See also *Advt.*, p. 75

**Ruthin, North Wales.**—*Ruthin Castle*. Private Hospital for Internal Diseases. Senior Physician, E. I. Spriggs, M.D., F.R.C.P. Ruthin, ¼ mile.

See also *Advt.*, p. xi

**Southampton.**—*Elmsleigh*, Bassett, Southampton. Early mental conditions. Apply, Res. Physician.

See also *Advt.*, p. 73

## PRINCIPAL BRITISH SPAS.

WITH INDICATIONS FOR THEIR THERAPEUTICAL EMPLOYMENT.

### THE BRITISH SPA FEDERATION.

**Bath (Somerset).**—Sheltered from N. and N.E. winds by hills from 600 to 800 feet high; 107 miles from London. Climate mild and equable.

*Waters.*—The only hot springs in Britain, varying from 104° to 120°, and the richest natural radio-active mineral waters in this country.

*Therapeutic Indications.*—Specially suitable for all rheumatic and gouty conditions, skin diseases of gouty and rheumatic origin, chronic laryngitis and pharyngitis, and mucous colitis and similar conditions.

*Baths.*—An extensive and thoroughly equipped bathing establishment; including deep baths (500 gallons of natural hot radio-active water), undercurrent douching, douche massage in many forms, and intestinal lavage (Plombières douches), throat sprays and inhalation of the natural radium emanation.

*Hotel.*—The Pulteney Hotel (*see p. 88*).

*Nursing and Baths.*—Lansdown Hospital and Nursing Home (*see p. 68*).

**Bridge of Allan (Stirlingshire).**—422 miles from London. Sheltered from N. and N.E. winds by the Ochil Hills. Average rainfall 35 inches. Climate mild and equable.

*Waters.*—Natural saline mineral springs (Airthrey).

*Therapeutic Indications.*—Chronic affections of the liver, stomach, and bowels, in many chest diseases, rheumatism, gout, sciatica, and in some diseases of the skin.

*Baths.*—Excellent suite of baths.

**Buxton (Derbyshire).**—1000 to 1200 feet above sea level; 163 miles from London; 23 miles from Manchester. Sheltered from north and east winds. Very bracing air.

*Waters.*—Simple, highly radio-active, natural temperature 82° F., mainly bicarbonate of calcium and magnesium ingredients. Tasteless, odourless; also chalybeate springs.

*Therapeutic Indications.*—Gout, rheumatism, rheumatoid arthritis, sciatica, and various nervous diseases, neurasthenia, disorders of digestion, and skin diseases, malaria, mucomembranous colitis, arteriosclerosis, phlebitis, diseases of the throat and air-passages; anæmic conditions, and convalescence from prolonged illness.

*Baths.*—Establishments, including St. Ann's Well (Pump Room), recently modernized.

*Hotel.*—The Old Hall Hotel (*see p. 86*).

**Cheltenham (Gloucestershire).**—184 feet above sea level; 101 miles from London. Climate soft and mild. Average rainfall 27 inches. Sunshine 1486 hours.

*Waters.*—Of four kinds: the Fieldholme or twin saline, containing nearly equal parts of magnesium sulphate and sodium sulphate; the Lansdown or sodium sulphate saline, the chief ingredients of which are sulphate and chloride of sodium; the Pittville or alkaline saline; and the Chadnor or magnesium and calcium saline.

*Therapeutic Indications.*—The toxic and congestive states associated with liver and stomach disorders, constipation, obesity, glycosuria, and gout.

*Baths.*—An excellent set of baths and douche and massage apartments at the Montpellier Baths, close to the Central Spa.

**Droitwich Spa (Worcestershire).**—150 feet above sea level; 2½ hours by express train from London (Paddington), 19 miles from Birmingham, 7 from Worcester. Rainfall 29 inches. Mean maximum temperature 65° F., mean minimum temperature 44° F.

*Waters.*—The most powerful saline in the world. The brine is pumped from the triassic formation 200 feet below the ground level at a temperature of about 45° F., and is heated by introducing steam.

*Therapeutic Indications.*—Chronic muscular and articular rheumatism, arthritis, chronic articular or irregular gout, neuritis, sciatica, neuralgia, some heart disorders, sprains and injuries of tendons, muscles, joints, etc.

*Baths.*—Reclining, douche, needle, vapour, swimming, Aix-douche, Nauheim baths, brine-pine or Homburg baths, etc.

*Hotels.*—Park Hotel (*see p. 90*); Raven Hotel (*see p. 90*); Worcestershire Brine Baths Hotel (*see p. 91*).

*Boarding Establishment.*—Ayrshire House (*see p. 91*).

**Harrogate (Yorkshire).**—450–600 feet above sea level, 203 miles from London. The climate is stimulating and fairly dry—bracing moorland air. Average rainfall 30 inches. Mean temperature 46° F.

*Waters.*—Celebrated for the medicinal properties of its 88 different mineral waters—sulphurous, chalybeate, alkaline, and saline.

*Therapeutic Indications.*—Gout and other metabolic disorders, functional liver derangement and early cases of cirrhosis, cholelithiasis and cholecystitis, chronic skin diseases,

neuritis and arthritis, mucous colitis, chronic dysentery, constipation, and intestinal toxæmias, anæmia, nervous diseases, hyperpæsis, and the sequelæ of tropical diseases.

*Baths*.—In the bathing establishments nearly 100 treatments are given.

*Mineral Water*.—‘Aquaperia’ aperient mineral water is bottled at Harrogate by Camwal Ltd. from their own Spring (see p. 151).

**Leamington Spa (Warwickshire)**.—195 feet above sea level; 88 miles from London. Equable and mild climate. Average rainfall 24·8 inches. Mean annual temperature 49°. Westerly winds prevail.

*Waters*.—Radio-active saline springs, resembling those of Homburg.

*Therapeutic Indications*.—Muscular and articular rheumatism, gout, rheumatoid arthritis, neuralgia, and neuritis, diseases arising from a plethoric condition of the chylipoietic viscera, conditions of increased vascular tension, and chronic interstitial nephritis.

*Baths*.—Turkish, massage douches, saline, Plombières, paraffin wax, Berthollet, electric, and swimming.

**Llandrindod Wells (Radnorshire)**.—750 feet above sea level. Climate exceedingly bracing, but sheltered from east winds, and with an average rainfall of about 40 inches. About 170 miles distant from London by road.

*Waters*.—Saline, sulphur and radium-sulphur, magnesium, lithia saline, and chalybeate. Slightly aperient and strongly diuretic.

*Therapeutic Indications*.—Digestive disorders, gout and rheumatism, rheumatoid arthritis, neuritis and fibrositis, gall-stones and biliary stasis, renal calculus or any kidney or bladder condition requiring diuresis, and in neurasthenia.

*Baths*.—Sulphur, immersion, needle, and douche; Aix and Vichy douche and massage; Scotch douche; Nauheim; medicated baths; fango and peat baths; whirlpool and agitation baths; and most electrical treatments.

*Hotel*.—Ye Wells Hotel (see p. 88).

**Strathpeffer Spa (Ross-shire, N.B.)**.—180 to 300 feet above sea level. Sheltered practically on all sides, except the N.E. Prevailing wind S.W. Bracing air. Average rainfall 31 inches. Mean annual temperature 45° F.

*Waters*.—Sulphurous and chalybeate. Sulphates the predominating salt. Have strong diuretic and mild aperient action.

*Therapeutic Indications*.—Chronic gout and rheumatism, rheumatoid arthritis, chronic skin diseases, chronic disorders of the digestive system, chronic gastric or intestinal catarrh, sluggish portal circulation, congested liver, and neurasthenia.

*Baths*.—Sulphurous (immersion), inhalation, peat, douche (Aix and Vichy), needle, pine, Russian, Nauheim, Plombières, radiant heat (electric), and high-frequency current.

**Trefriw Wells (Carnarvonshire)**.—5 hours from London. The climate is bracing, the air soft, pure, and mostly of a westerly or south-westerly type. The pump-room and baths are open all the year, but the principal season is March to the end of October.

*Waters*.—Two varieties: (1) The stronger sulpho-chalybeate, and (2) the milder sulpho-chalybeate. Used internally, and externally in the form of baths.

*Therapeutic Indications*.—Curable forms of anæmia, nervous, debilitating and wasting diseases, rheumatism, sciatica, gout, and neuritis.

**Woodhall Spa (Lincolnshire)**.—50 feet above sea level. 124 miles from London. Average rainfall 22½ inches.

*Waters*.—Bromo-iodine waters, rich in the chlorides of sodium, calcium, and magnesium, with bromine and iodine.

*Therapeutic Indications*.—Rheumatism (chronic articular and muscular), lumbago, arthritis deformans, gouty arthritis, sciatica, neuritis, paralysis, neurasthenia; injuries to joints; skin diseases, psoriasis, urticaria; diseases peculiar to women; diseases of throat and nose; liver disorders.

*Spa Baths*.—These include immersion, shower, undercurrent, and local douches; Aix and Vichy douche massage; Nauheim, electric, and Schnee baths; Dowsing radiant heat and light baths.

**New Zealand Spas**.—Many of the mineral waters of New Zealand are quite unlike any European waters; others are of kinds familiar in Europe, but stronger in mineralization than most Continental waters. The principal spas are:—

**ROTORUA**.—A first-class, well-equipped spa, with complete modern bathing establishment and limitless supply of *sulphur waters* of two main types: alkaline sulphur, containing sodium chloride, bicarbonate, and silicate; and acid sulphur, used for baths only.

*Climate and Season*.—The spa being 1000 ft. up, the climate is by no means hot. Season from December to May, but baths open all the year round.

**TAUPO**.—The most elevated spa in New Zealand.

*Climate*.—Tonic and sedative. The waters are hot salines, with carbonic acid gas; also alkaline and chalybeate.

TE AROHA.—Hot *alkaline waters* of the Vichy type, but double the strength. There are comfortable baths, but this is essentially a place for drinking the waters, which are unique in their strength of sodium bicarbonate.

*Climate*.—Mild and sedative.

HANMER.—In the South Island; has mild sulphur baths and a bracing climate.

#### OTHER BRITISH SPAS.

**Church Stretton (Salop)**.—613 feet above sea level. 153 miles from London. Pure bracing air, and a generally invigorating climate. Prevailing wind, S.W. Average rainfall 33 inches. Mean temperature 44°.

*Waters*.—Said to be the purest in Great Britain.

*Therapeutic Indications*.—Specially the 'open-air' cure of neurasthenia, for sequelæ of influenza, for insomnia, functional nervous diseases, chronic gout and rheumatism, chronic gastric and bronchial catarrh, debility from overwork, and convalescence after illness or operation.

**Ilkley (Yorkshire)**.—Situated on the southern slope of the valley of the Wharfe, 211 miles from London, 18 miles from Harrogate. Occupying a sheltered position. Average rainfall 39 inches. Mean annual temperature 47° F. Bracing and invigorating moorland air.

*Waters*.—The water-supply obtained from springs is remarkably pure, bright, and sparkling. Chalybeate waters. Saline.

*Therapeutic Indications*.—Gout, rheumatism, neuritis, neurasthenia, anæmia, asthma, and bronchitis cases are benefited. The treatment adopted is that known as hydro-therapeutic.

*Baths*.—Complete suites of baths are to be found in the numerous establishments. Electrical, Weir-Mitchell.

*Hydropathic Establishment*.—Craiglands Hydropathic (see p. 86).

**Llangammarch Wells (Breconshire)**.—600 feet above sea level. 213 miles from London. Well protected from the east, and prevailing wind is S.W.

*Water*.—Saline, containing the chlorides of barium (6½ grains per gallon), calcium, magnesium, lithium, and sodium; the only one of its kind in the British Isles.

*Therapeutic Indications*.—Cardiac diseases, organic and inorganic, especially affections of the myocardium due to influenza. Graves' disease, chronic muscular and articular rheumatism, osteo-arthritis, gout, sciatica, and neurasthenia.

**Malvern (Worcestershire)**.—520 feet above sea level. A health centre of long repute, 122 miles from London. Air dry and bracing. Prevailing winds S.W. and W. Average rainfall 28 inches. Mean temperature about 49° F. Exceptional sunshine records.

*Waters*.—Mainly spring, of remarkable purity, free from organic matter, less than 4 grains of earthy salts per gallon, with high eliminative qualities. The water is dispensed in a new Pump Room adjoining the Winter Gardens and Priory Park.

*Therapeutic Indications*.—Gout, rheumatism, rheumatoid arthritis, neuralgia, sciatica, lumbago, dyspepsia, constipation, anæmia, bronchial, nephritic, and cutaneous diseases.

*Treatments*.—Medical baths are in course of provision and several modern treatments are already available at the principal nursing institutions.

**Matlock Bath (Derbyshire)**.—300 to 800 feet above sea level, 143 miles from London. Average rainfall 36 inches. Mean temperature about 47° F. Very sheltered.

*Waters*.—Thermal springs. Mild sulphated alkaline-saline waters at 68° F., containing 33 grains per gallon of salts, mainly magnesium and calcium bicarbonate, and magnesium sulphate.

*Therapeutic Indications*.—Rheumatism, gout, rheumatoid arthritis, neuritis, neurasthenia, catarrhs (bronchial, gastric, or enteric), anæmia, cardiac asthenia, chronic diseases of the liver or kidneys, digestive and biliary disorders.

*Baths*.—A complete modern installation exists for the administration of all kinds of baths, douches, packs, and other hydropathic treatment, electricity, massage, inhalations, Nauheim baths, with Swedish exercises.

**Matlock Bank (Matlock station, one mile by rail from Matlock Bath)**.—South-westerly aspect, and well sheltered from the north. 144 miles from London. Climate mildly bracing. Sunshine above the average. The Matlock system of hydropathic treatment is carried out in all its branches, and the principal hydros are installed with latest electric baths and appliances, including high-frequency, dowsing radiant heat and light, Schnee four-cell, X rays, etc. They also include Turkish, Russian, plunge, medicated, and inhalation baths, Aix and Vichy douches.

*Hydropathic Establishments*.—Rockside Hydro (see p. 89); Smedley's Hydropathic (see p. 87).

**Peebles (Peeblesshire, N.B.).**—About 500–600 feet above sea level. One hour from Edinburgh and 382 miles from London. Average rainfall, about 38 inches. Bracing climate, but sheltered from the north winds.

**Waters.**—The chief ingredient is chloride of sodium. They are obtained from the famous St. Ronan's Well (6 miles east).

**Therapeutic Indications.**—The waters are specially suited to the Naulheim and Bourbon Lancy treatment of cardiac disease, dyspepsia, gout, rheumatism, and neurasthenia.

**Baths.**—The baths at the hydropathic are of the most modern type. Complete electrical installation and mud baths (Fango-di-Battaglia).

**Torquay (Devonshire).**—England's Marine Spa. 199½ miles from London. Non-stop express trains run daily, the journey occupying only 3¼ hours. There are through carriages from Northern and Midland cities. The most beautifully situated marine health resort in the British Isles. Well sheltered from the north. The sunshine record is one of the highest in the country. Average rainfall, 38 inches. Mean temperature, 51.2°. Sunshine record averages 1784 hours. Ultra-violet rays 1930, 3.64 units. The meteorological station in Abbey Park is situated in a most open position in the Borough and is approved by the Air Ministry.

**Climate.**—Mild, soft, and equable. It is specially beneficial for many pulmonary, bronchial, and laryngeal conditions, for mild cases of nephritis, for delicate children, and for aged and debilitated persons. Those unable to withstand the rigour of the winter in other British health resorts derive great benefit from residence in Torquay. The season is all the year round.

**Baths.**—The medical baths are very modern and complete. They are ideally situated overlooking Tor Bay. All the well-known forms of spa treatment are available. A trained and skilled staff is always in attendance. Medical consultation rooms have been opened for the convenience of medical practitioners and patients. There is a large sea-water swimming bath, tepid or warm according to season. Salt-water baths, concentrated brine baths, seaweed baths, and Dartmoor peat packs are a speciality. The treatments are indicated for rheumatism, sciatica, arthritis, gout, etc. The Torquay natural mineral water of the same type as Evian and Vittel is served at the Baths or may be purchased in bottle. (See also p. xlv.)

**Tunbridge Wells (Kent).**—400 feet above sea level, 34 miles from London. Climate is tonic and invigorating. Prevailing winds W. and S.W. Average rainfall, about 30 inches. Mean temperature, 49°.

**Waters.**—A weak, non-aerated, chalybeate spring, containing 4 grains ferrous carbonate to the gallon, with sulphates and chlorides of potash, soda, and calcium.

**Therapeutic Indications.**—Waters indicated in anemia, chlorosis, and allied conditions.

**Baths.**—Immersion, douche, needle, Turkish, Russian, vapour, swimming, medicated, and electric light.



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- Indian Medical Gazette—Monthly, Rs. 16 per annum—Thacker, 2, Creed Lane, E.C.4.
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- Journal of Clinical Pathology—Six times a year for 23/6—8, Henrietta Street, W.C.2.
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- Journal of Comparative Psychology—Twice monthly, 4/6—8, Henrietta Street, W.C.2.
- Journal of Experimental Biology—Occasionally, 12/6—Cambridge University Press, Fetter Lane, E.C.4.
- Journal of Immunology—Twice monthly, 4/6—8, Henrietta Street, W.C.2.
- Journal of Nutrition—Six times yearly, 21/- per annum—8, Henrietta Street, W.C.2.
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- Laryngology and Otology, Journal of—Monthly 4/- ; 40/- per annum—Oliver & Boyd, Tweeddale Court, Edinburgh.
- Laryngoscope, The—Monthly, 35/- per annum—Baillière, 8, Henrietta Street, W.C.2.
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- Medical Annual—Yearly 20/- net ; Subscribers before publication 17/- net, post free—John Wright & Sons Lim., Bristol.
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- Medical Officer—Weekly 1/- ; 42/- per annum (and Supplement monthly : The Jennerian)—36-38, Whitefriars Street, E.C.4. (*See Advertisement*, p. 47.)
- Medical Press and Circular—Weekly 6d. ; 21/- per annum—8, Henrietta Street, W.C.2, (*See Advertisement*, p. 43.)

- Medical Register—Yearly 21/-—Constable, 10, Orange Street, W.C.2.  
 Medical and Dental Students' Register—Yearly 7/6—10, Orange Street, W.C.2.  
 Medical Times—Monthly 6d.—8 & 9, St. Alban's Place, Islington, N.1.  
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 Post-Graduate Medical Journal—Monthly 6d.—1, Wimpole Street, W.1.  
 Practitioner—Monthly, 4/-; 42/- per annum—6 & 8, Bouverie St., E.C.4. (See *Advertisement*, p. 11.)  
 Prescriber—Monthly, 2/-; 20/- per annum—13, Glencairn Crescent, Edinburgh, W. (See *Advertisement*, p. 22.)  
 Psycho-analysis, International Journal of—Quarterly, 30/- per vol.—8, Henrietta Street, W.C.2.  
 Psychology, British Journal of—Quarterly (Medical Section), 30/-; (General Section), 30/- net per volume—Cambridge University Press, Fetter Lane, E.C.4.  
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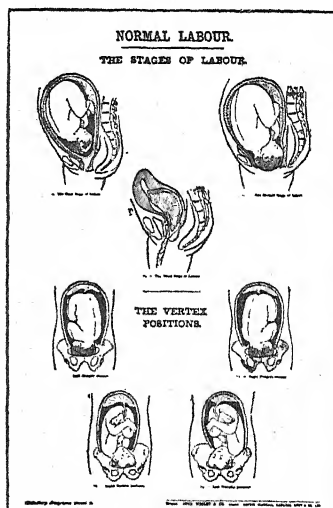
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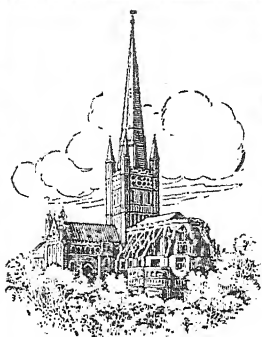
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TITLE, ETC., OF OFFICE.	A	B	C	D	E
Abstainers and General Insurance Co., Ltd., Edmund St., Birmingham. <i>Man. Director</i> , H. J. Greening. London Office, Insurance House, Kingsway, W.C.2 P	1883	43/5	58/6	84/1	2,955,008
African Life Assurance Society, Ltd., River Plate House, Finsbury Circus, E.C.2. <i>Sec.</i> , M. B. Massey-Hicks, F.I.S.A.	1904	49/-	67/3	96/7	*4,006,509
Alliance Assurance Co. Ltd., Bartholomew Lane, E.C.2. <i>Gen. Man.</i> , A. Levine .. .. P	1824	49/1	65/1	90/10	22,300,374
Atlas Assurance Co. Ltd., 92, Cheapside, E.C.2. <i>Gen. Man.</i> , C. H. Falloon. <i>Act. and Life Man.</i> , William Penman .. .. P	1808	48/1	63/7	88/4	7,260,543
Australian Mutual Provident Society, 73-76, King William St., E.C.4. <i>Man. for U.K.</i> , D. E. Walker .. .. M	1849	48/2	64/5	89/10	80,783,581
Britannic Assurance Co. Ltd., Life, Fire, Accident, and General Insurances, Broad St. Corner, Birmingham. <i>Chairman</i> , Jno A. Jefferson, F.I.A. <i>Sec.</i> , J. M. Laing, F.I.A., F.F.A. <i>Further particulars see opposite page</i> .. .. P	1866	47/9	64/-	91/1	20,000,000
British Equitable Assurance Co. Ltd., Eastern Entrance, Royal Exchange, E.C.3. <i>Man.</i> , Douglas A. Coleman .. .. P	1854	48/8	64/11	91/9	1,713,487
British General Insurance Co. Ltd., 66, Cheapside, E.C.2. <i>Man. Dir.</i> , Norman M. Walker .. .. P	1904	49/5	64/10	90/7	842,146
†British Widows' Assurance Co. Ltd., 1, Old St., E.C.1. <i>Joint Gen. Mans.</i> , Robert J. Jamieson and F. E. Crabtree .. .. P	1902	—	—	—	546,506
Caledonian Insurance Co., 19, George St., Edinburgh. <i>Gen. Man.</i> , F. J. Cameron, F.F.A., F.I.A., London (City) Office, 5, Lothbury, E.C.2 .. .. P	1805	48/5	64/6	90/7	6,683,743
Canada Life Assurance Co., 2, St. James's Square, S.W.1. <i>Man.</i> , J. R. Wandless, F.I.A. .. .. P	1847	48/5	65/4	94/2	37,263,059
Clerical, Medical, and General Life Assurance Society, 15, St. James's Square, S.W.1, and 8, King William St., E.C.4. <i>Gen. Man.</i> , A. D. Besant. .. .. P	1824	47/6	65/2	94/10	10,584,987
Colonial Mutual Life Assurance Society Ltd., 4 St. Paul's Churchyard, E.C.4. <i>Man.</i> , Ernest A. Cawdron. <i>Sec.</i> , J. S. Gillespie .. .. M	1873	48/9	65/1	89/10	13,000,000
Commercial Union Assurance Co. Ltd., 24, Cornhill, E.C.3. <i>Act.</i> , A. G. Allen .. .. P	1861	46/3	63/3	93/2	18,369,635
Confederation Life Association (of Canada), Bush House, Aldwych, W.C.2. <i>Man.</i> , G. T. Varney. P	1871	48/6	65/2	94/2	16,795,088
Co-operative Insurance Society Ltd., 109, Corporation Street, Manchester. <i>Man.</i> , J. P. Jones .. .. M	1867	47/4	63/1	90/1	4,682,383
Eagle Star & British Dominions Insurance Co. Ltd., 1, Threadneedle St., E.C.2.; Life Dept., 32, Moorgate, E.C.2. <i>Man. Dir.</i> , Sir Edward M. Mountain, Bart., J.P. .. .. P	1807	48/1	63/10	89/5	15,657,155
Equitable Life Assurance Society, 19, Coleman Street, E.C.2. <i>Act. and Man.</i> , W. Palin Elderton, F.I.A. M	1762	54/-	68/-	92/-	7,500,251
Equity & Law Life Assurance Society, 18, Lincoln's Inn Fields, W.C. <i>Man. and Sec.</i> , A. C. Thorne, F.I.A. .. .. P	1844	48/10	64/6	90/9	8,704,233

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TITLE, ETC., OF OFFICE.	A	B	C	D	E
Friends' Provident & Century Life Office, 7, Leadenhall Street, E.C.3, and 18, Charlotte Square, Edinburgh. <i>Gen. Man.</i> , Henry J. Tapscott. <i>Act. and Sec.</i> , Alfred Moorhouse, F.I.A. .. M	1832	48/-	64/3	89/9	*6,184,676
General Life Assurance Company, General Buildings, Aldwych, W.C.2. <i>Man. and Act.</i> , J. Mayhew Allen. P	1837	49/2	64/11	91/3	2,768,554
Gresham Life Assurance Society Ltd., 188-190, Fleet St., E.C.4. <i>Gen. Man.</i> , Alex. Lawson .. P	1848	47/6	62/10	88/6	8,054,746
Guardian Assurance Co. Ltd., 68, King William St., and 21, Fleet Street, E.C. <i>Gen. Man.</i> , Geo. W. Reynolds. <i>Sec.</i> , A. G. Sweet, <i>Act.</i> , W. A. Osborne P	1821	48/10	64/6	89/3	6,161,760
Law Union and Rock Insurance Co. Ltd., 7, Chancery Lane, W.C. <i>Sec.</i> , J. Stirling .. P	1806	48/4	64/-	89/10	10,870,590
Legal & General Assurance Society Ltd., 10, Fleet St., E.C. <i>Gen. Man.</i> , W. A. Workman, F.I.A. P	1836	—	—	—	20,692,730
Life Association of Scotland, 82, Princes St., Edinburgh. <i>Man. and Act.</i> , R. M. M. Roddick. <i>Sec.</i> , A. G. R. Brown, London, 28, Bishopsgate, E.C. <i>Sec.</i> , G. S. N. Carter .. P	1833	48/11	64/10	91/1	6,979,775
Liverpool and London and Globe Insurance Co. Ltd., 1, Dale Street, Liverpool. <i>Gen. Mans.</i> , F. J. Williams and J. Dyer Simpson. London Office, 1, Cornhill, E.C.3 .. P	1836	49/10	65/9	91/3	9,500,465
London & Scottish Assurance Corporation Ltd., King William Street House, Arthur Street, E.C.4. <i>Man.</i> , Frank B. Cooke. <i>Sec.</i> , A. G. H. Emslie. <i>Act.</i> , Harold Dougharty .. P	1862	48/9	64/9	91/2	4,783,986
London Assurance, The, 1, King William St., E.C. <i>Act. and Life Man.</i> , A. G. Paton, F.I.A. .. P	1720	49/-	64/8	90/2	6,401,293
London Life Association Ltd., 81, King William St., E.C.4. <i>Act. and Man.</i> , H. M. Truncer, M.A., F.I.A. .. M	1806	45/3	59/-	82/-	21,763,692
Marine and General Mutual Life Assurance Society, 48, Fenchurch Street, E.C.3. <i>Act. and Sec.</i> , Howard T. Cross, F.I.A. .. M	1852	48/10	65/-	91/6	3,485,917
Medical Sickness Annuity & Life Assurance Society, Ltd., 300, High Holborn, W.C. <i>Man. and Sec.</i> , Bertram Sutton, F.C.I.I. .. M	1884	40/2	55/3	80/-	307,820
Mutual Life and Citizens' Assurance Co. Ltd. (of Australia), Eppingham Ho., 1, Arundel St., W.C. <i>Man.</i> , Alex. S. Sellar, M.A., F.F.A. .. P	1886	48/9	65/3	89/9	18,131,848
National Mutual Life Assurance Society, 39, King St., Cheapside, E.C. <i>Gen. Man.</i> , G. Marks, C.B.E., F.I.A. <i>Act. and Sec.</i> , G. H. Recknell, F.I.A., F.F.A. .. M	1830	48/4	63/7	89/6	5,078,107
National Mutual Life Association of Australasia, Ltd., 5, Cheapside, E.C.2. <i>Man.</i> , H. W. Meyers.. M	1869	46/8	61/6	87/2	34,000,000
National Provident Institution, 48, Gracechurch St., E.C.3. <i>Act. and Sec.</i> , H. E. Melville, F.I.A. M	1835	50/2	66/3	91/1	10,687,109
North British & Mercantile Insurance Co. Ltd., 61, Threadneedle St., E.C.2 and 64, Princes St., Edinburgh. <i>Man. Dir.</i> , London, Sir A. Worley, Bt., C.B.E. <i>Man.</i> , Edinburgh, J. E. Bell. .. P	1809	49/10	66/1	91/11	28,552,262
Northern Assurance Co. Ltd., 1, Moorgate, E.C.2. <i>Gen. Man.</i> , K. K. Peters.. P	1836	49/-	64/8	90/10	6,713,253
Norwich Union Life Insurance Society, Norwich. <i>Gen. Man. and Act.</i> , M. Mackenzie Lees, F.F.A. <i>Sec.</i> , H. G. Wilton, F.I.A. London, 49, Fleet St., E.C.4. <i>Further particulars see page 12</i> .. M	1808	51/9	66/6	92/5	33,726,961
Pearl Assurance Co. Ltd., 252, High Holborn, W.C.1. <i>Man. Director</i> , J. McIntyre. .. P	1864	49/-	65/-	92/-	58,833,715



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<b>Provident Mutual Life Assurance Association</b> , 25 to 31, Moorgate, E.C.2. <i>Man. and Act.</i> , C. R. V. Coutts, F.I.A. .. M	1840	48/8	64/8	90/4	8,000,000
<b>Prudential Assurance Co. Ltd.</b> , Holborn Bars, E.C.1. <i>Gen. Man.</i> , Sir Joseph Burn, K.B.E., F.I.A. P	1848	47/-	64/6	91/2	217,984,130
<b>Refuge Assurance Co. Ltd.</b> , Oxford Street, Manchester. <i>Man. Dir.</i> , J. Proctor Green. <i>Gen. Man.</i> , S. G. Leigh, F.I.A., London, 133, Strand, W.C. P	1864	49/3	65/9	91/9	48,868,247
<b>Royal Exchange Assurance</b> , Royal Exchange, E.C.3, and 44, Pall Mall, S.W.1. <i>Act.</i> , T. F. Anderson, F.I.A., F.F.A. .. P	1720	49/-	64/9	90/2	9,671,651
<b>Royal Insurance Co. Ltd.</b> , 1, North John St., Liverpool. <i>Gen. Mgrs.</i> , F. J. Williams and J. D. Simpson. London Offices, 24-28, Lombard St., E.C.3. <i>London Man.</i> , W. Carter .. P	1845	48/-	64/8	90/-	22,255,781
<b>Royal London Mutual Insurance Society Ltd.</b> , Finsbury Sq., E.C.2. <i>Man. Dir.</i> , Alfred Skeggs. <i>Sec.</i> , J. H. Skinner. <i>Act.</i> , J. H. Duffell, F.I.A. .. M	1861	46/8	63/9	91/7	22,915,619
<b>Scottish Amicable Life Assurance Society</b> , St. Vincent Place, Glasgow. <i>Man. and Act.</i> , A. Gordon-Smith. <i>Sec.</i> , R. Jeffrey. London, 17, Tokenhouse Yard, E.C.2. <i>Sec.</i> , F. K. Fenton .. M	1826	50/1	65/9	90/6	10,508,446
<b>Scottish Equitable Life Assurance Society</b> , 28, St. Andrew Square, Edinburgh. <i>Man. and Act.</i> , C. Guthrie. <i>Secs.</i> , W. R. McIlvenna, and A. C. Murray. London Office, 13, Cornhill, E.C.3. <i>Sec.</i> , W. S. King. ( <i>Premiums cease at age 75</i> ) .. M	1831	50/6	67/6	97/-	9,603,009
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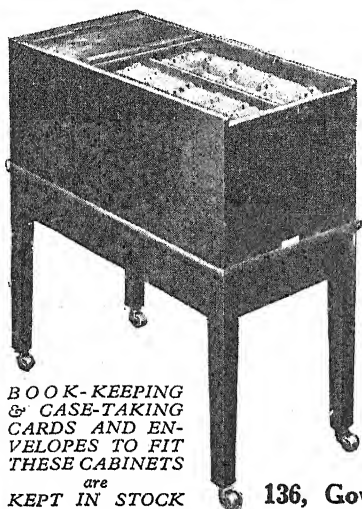
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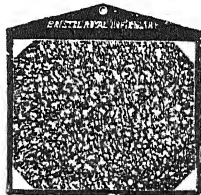
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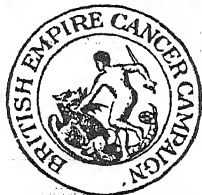


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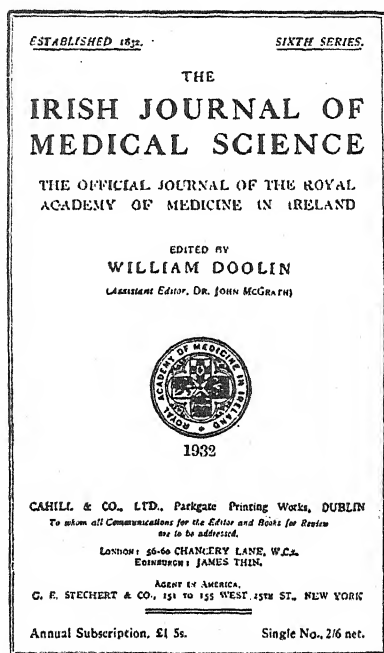
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- (b) Instruction of Medical Students, and advanced post-graduate courses in Psychological Medicine;
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*(Men Students only are eligible for admission.)*

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MILE END, E.1.

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(UNIVERSITY OF LONDON)

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**THE ATHLETIC GROUND** is within 10 minutes' walk of the Hospital.

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The Calendar, Details of Scholarships, etc., will be sent on application to the DEAN, H. WILLOUGHBY LYLE, M.D., B.S. (Lond.), F.R.C.S., J.P.; or to the Secretary, S. C. RANNER, M.A. (Cantab.), King's College Hospital Medical School, Denmark Hill, London, S.E.5.

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Secretary: MAJOR RAPHAEL JACKSON.

**THE POOREST OF THE POOR** are treated at this Hospital. Normal Accommodation, 216 Beds. Cost of Endowing a Bed, £1000; a Cot, £500. Funds most urgently needed to meet current expenditure, and will be gratefully received by W. A. VERNON, Esq., Hon. Treasurer, Hawkwell Place, Pembury, Kent, or by the Secretary.

In-Patients treated, 1930	.. 3,461	Out-Patient Attendances, 1930	.. 159,182
Accidents treated, 1930	.. 22,502	Ordinary Expenditure, 1930	£16,892/5/4
Income from Annual Subscriptions and Invested Property		..	£4,772/12/4

RAPHAEL JACKSON (Major), Secretary.

# UNIVERSITY OF BRISTOL.

## FACULTY OF MEDICINE.

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DOCTOR OF MEDICINE .. .. .	M.D.
DOCTOR OF PHILOSOPHY .. .. .	Ph.D.
BACHELOR OF DENTAL SURGERY .. .. .	B.D.S.
MASTER OF DENTAL SURGERY .. .. .	M.D.S.
DIPLOMA IN DENTAL SURGERY .. .. .	L.D.S.
DIPLOMA IN PUBLIC HEALTH .. .. .	D.P.H.

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**CLINICAL WORK** is done at the Bristol Royal Infirmary and the Bristol General Hospital, which together contain 668 beds. The Bristol Royal Hospital for Sick Children and Women (100 beds), the Bristol Eye Hospital, the Bristol City and County Asylum, the Bristol City Fever Hospital and, by the kind permission of the Health Committee of the Bristol City Council, Southmead Infirmary are also open for the clinical instruction of students.

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For further particulars and prospectus apply to the DEAN of the Faculty of Medicine.



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Principal—SIR T. H. HOLLAND, K.C.I.E., K.C.S.I., LL.D., F.R.S.

The SUMMER SESSION, 1932, opens on April 19th, and closes on July 1st.

The WINTER SESSION, 1932-33, opens on October 5th.

## FACULTY OF MEDICINE.

Dean—PROFESSOR SYDNEY SMITH, M.D., D.P.H.

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*Anatomy*—J. C. Brash, M.D. [F.R.S.  
*Physiology*—Sir E. Sharpey-Schafer, LL.D.  
*Materia Medica*—Alfred J. Clark, M.C., M.D., F.R.C.P.  
*Pathology*—A. Murray Drennan, M.D., F.R.S.  
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*Forensic Medicine*—Sydney Smith, M.D., D.P.H.  
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*Surgery*—D. P. D. Wilkie, M.D., Ch.M.  
*Midwifery and Gynecology*—R. W. Johnstone, M.A., M.D.  
*Clinical Surgery*—John Fraser, Ch.M., M.D.  
*Clinical Medicine*—Edwin Bramwell, M.D., W. T. Ritchie, M.D., and D. Murray Lyon, M.D.  
*Tuberculosis*—Sir Robert W. Philip, M.D.  
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A Syllabus and further information as to Matriculation, the Curricula of Study for Degrees, etc., may be obtained from the Dean of the Faculty of Medicine; and for Degrees in the Faculties of Arts, Science, Divinity, Law, and Music, from the Deans of these Faculties, or from the Secretary; and full details are given in the University Calendar, published by James Thin, 55, South Bridge, Edinburgh. Price by post, 6s.

October, 1931.

By Authority of the Senate,  
 W. A. FLEMING, Secretary.

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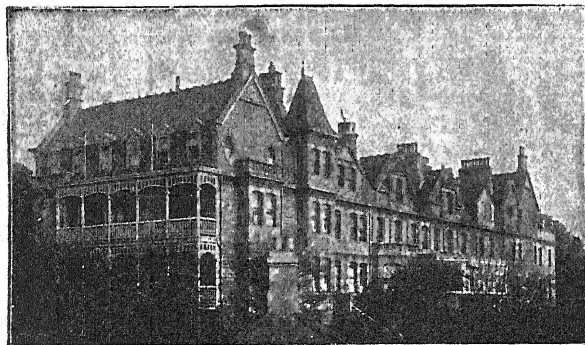
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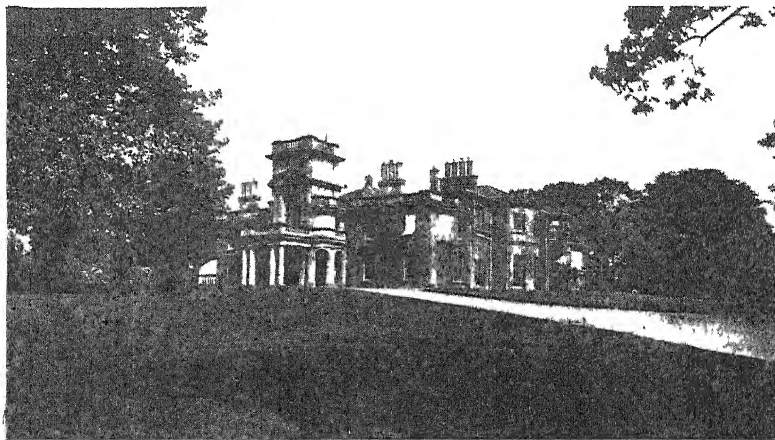
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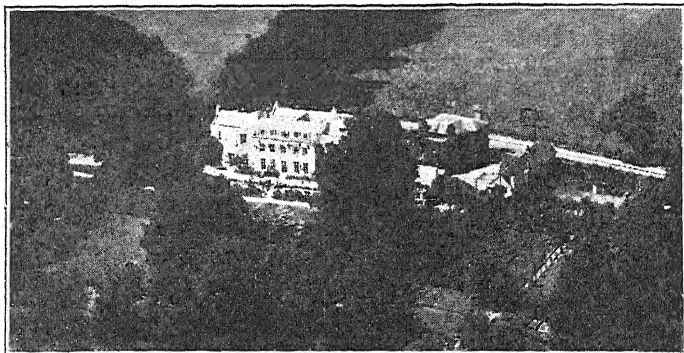
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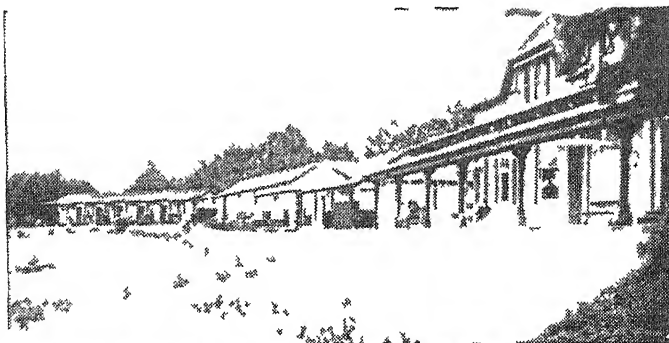
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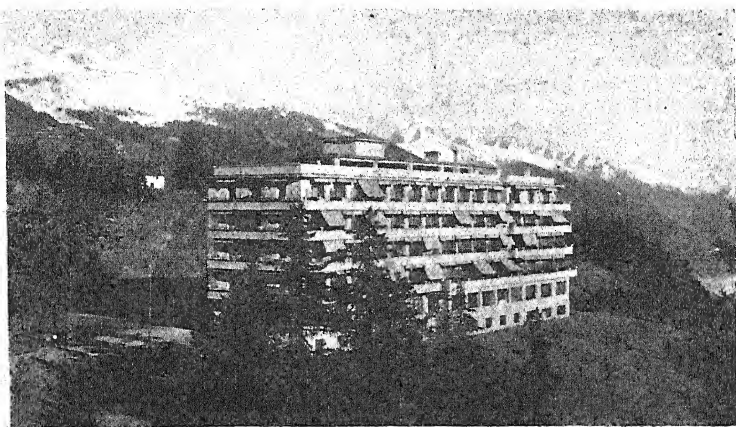
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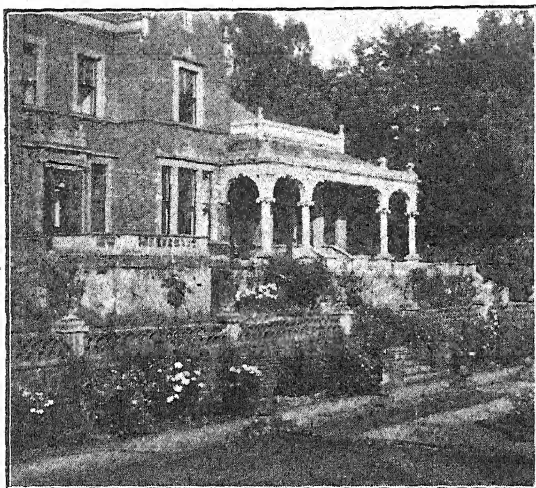
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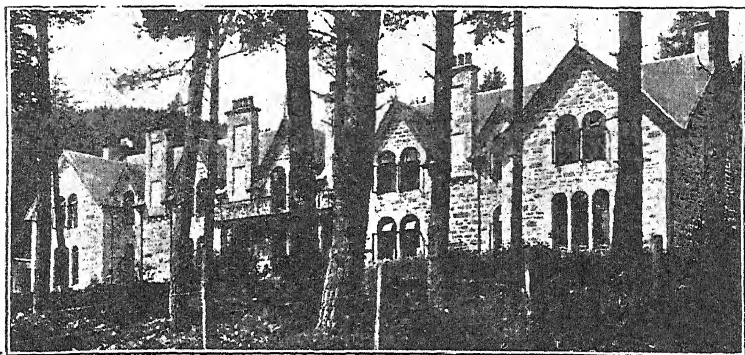
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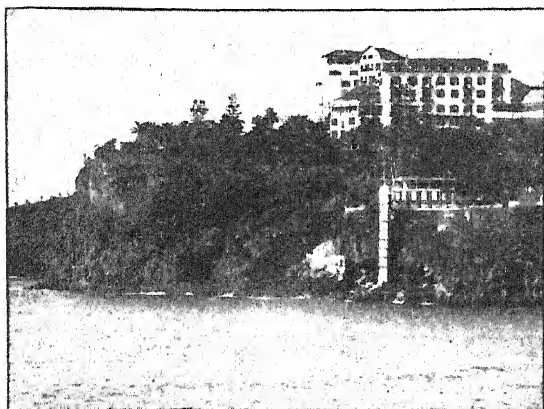
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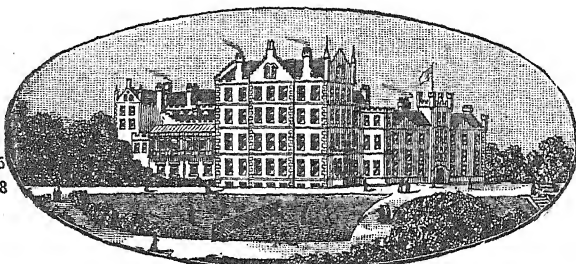
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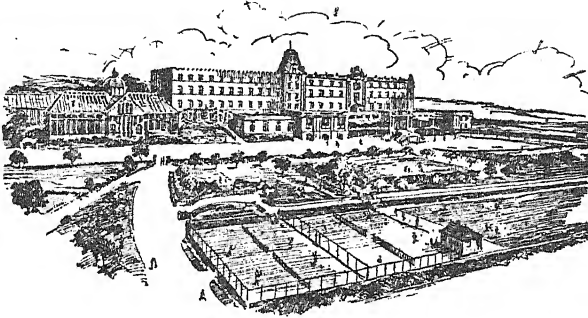
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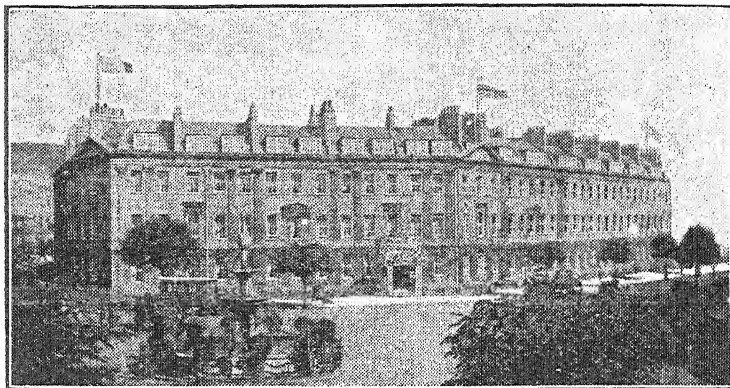
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NEAR the Pump Room, Baths, Golf Links, and surrounding Hills. TWO ELECTRIC LIFTS—outside fire-escape staircase—running Hot and Cold Water in Bedrooms. Two Croquet Lawns and Two Hard Tennis Courts in own grounds. Central Heating. Open all the year.

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Teleg. Address :  
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THIS high-class Hotel occupies the choicest site on the beautiful Hindhead Hills, about 850 ft. above sea level. ∞ Electric Lift to all floors. Vita Glass Sun Lounge. Tennis (Hard and Grass Courts). Saddle Horses. ∞ Illustrated Tariff on application to Managers.

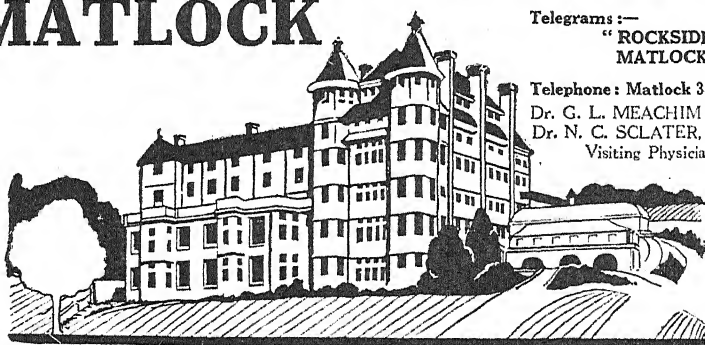
*Good Golf Course near.*

**HINDHEAD, Haslemere**

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Telegrams :—  
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Telephone : Matlock 312.  
Dr. G. L. MEACHIM &  
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## THE NEW MODERN BATHS

include Turkish, Russian, Large Plunge, Medicated Inhalation, Aix, Vichy, Plombiere and other Douches, High-Frequency Ionisation, etc. ULTRA-VIOLET RAY Treatment, Infra Red Ray and Diathermy, Massage, Swedish Exercises, Soapless Foam and Whirlpool Baths. The Baths are "en suite" within the Hydro. Patients can return to their own or public rooms without risk of cold.

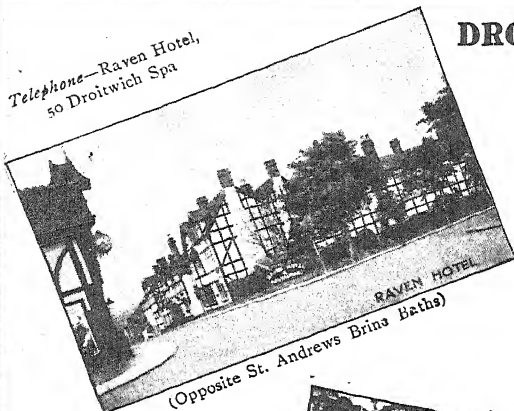
## The FAVOURITE ALL-THE-YEAR HEALTH & PLEASURE RESORT

Tennis. Croquet. Billiards.  
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Modern throughout. Grounds 5 acres.  
Latest Equipment. Central Heating.  
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Ballroom Lounge. Stage for Entertainments.

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Telephone—Raven Hotel,  
50 Droitwich Spa



RAVEN HOTEL  
(Opposite St. Andrews Brine Baths)

## DROITWICH SPA

### Raven Hotel and Park Hotel

**SERVICE:** Magnificent situation. Extensive grounds. Excellent cuisine. Fully licensed. Garage with 40 lock-ups.  
**APPOINTMENTS:** Enlarged, re-decorated, re-furnished. Electric light. H. & C. Water in best bedrooms.

Telephone—Park Hotel,  
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#### TWO HOTELS OPEN ALL THE YEAR

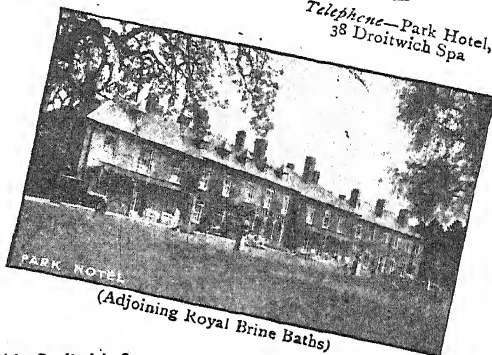
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PARK HOTEL  
(Adjoining Royal Brine Baths)

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## PRINCE OF WALES HOTEL, SOUTHPORT

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Excellent Cooking. Comfort. Moderate Terms. Great Golfing Centre.  
Motorists' Headquarters (A.A., R.A.C., etc.) - - - Garage.

ALSO Special Diet arranged for Invalids.  
**ROYAL HOTEL, SOUTHPORT.** Best position on Promenade.

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### THE ROYAL NORFOLK HOTEL

Leading Family Hotel—splendidly situated facing South—occupying finest position on Esplanade—overlooking sea and own extensive grounds

**Bracing Climate      Good Cuisine      Every Comfort**

Excellent winter residence — Central Heating — Fishing — Close to Tennis and Croquet Clubs—Convenient for Golf—Good riding available

*Motor Garage—Moderate Charges.*

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# THE Worcestershire Brine Baths Hotel

— OPEN THROUGHOUT THE YEAR —  
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Enlarged to 175 Rooms, all with Hot and Cold Water and Electric Fires. New Wing Extension, 26 Rooms with Heating Radiator in each. Two Electric Lifts.

Dining Room and Lounge enlarged  
— and Oak Dancing Floor. —

Ground-floor Bedrooms. Suites. Library.  
Night Porter. Billiards.

Hard and Grass Tennis Courts in private grounds opposite. Within a mile of New 18-hole Golf Club House. Two Garages. Saloon Cars for Hire. A.A. and R.A.C.

**"EN PENSION" TERMS according to rooms.**  
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## Ayrshire House, Droitwich Spa

### BOARDING ESTABLISHMENT.

CHARMINGLY situated in beautiful gardens near to Brine Baths. Centrally heated in winter. Hot & Cold Water. Electric Light, and Gas or Electric Fires in Bedrooms. Every modern comfort. Excellent Cuisine. Enlarged in 1927.

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## Lansdowne Private Hotel

GRAND PARADE.

Recently Enlarged. Situated in the best part of Eastbourne, overlooking Sea and Lawns. Three minutes from Devonshire Park, Baths, etc. Ten minutes from Golf Links. Separate Tables. Electric Light and Fires. Every comfort and attention. Ball-room. Noted for Excellent Cuisine.

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# CHISWICK HOUSE

PINNER, Middlesex

Telephone :  
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A Private Mental Hospital for the Treatment  
and Care of Mental and Nervous Disorders  
in both Sexes

A Modern Country House, 12 miles from Marble Arch, in beautiful and secluded grounds.

Certified, Temporary, and Voluntary Patients. Terms are from ten guineas a week, including all expenses.



*Lately removed from  
Chiswick House, Chiswick.*

DOUGLAS MACAULAY,  
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# LAVERSTOCK HOUSE

SALISBURY, WILTSHIRE.

**A**N Old-established Private Home for the care and treatment of mentally afflicted Ladies and Gentlemen. Situated one mile from Salisbury. Stands in beautifully timbered pleasure grounds. Surroundings bright, cheerful and pleasant. Every form of recreation and outdoor amusement provided. Patients requiring only slight supervision can be accommodated in separate villas in the grounds.

Voluntary Boarders are received without certificates.

Railway Stations	-	-	-	G.W.R. and Southern
Telegrams	-	-	-	"Benson, Laverstock," Salisbury
Telephone	-	-	-	Salisbury 12

FOR FURTHER PARTICULARS, APPLY TO THE  
MEDICAL SUPERINTENDENT.

# BETHLEM ROYAL HOSPITAL

Monks Orchard, Eden Park  
Beckenham, KENT

## For the Reception and Treatment of Cases of NERVOUS & MENTAL DISEASE

*President*—LORD WAKEFIELD OF HYTHE, C.B.E., LL.D.  
*Treasurer*—Sir LIONEL FAUDEL PHILLIPS, Bt.  
*Physician Superintendent*—J. G. PORTER PHILLIPS, M.D., F.R.C.P.  
*Senior Assistant Physician*—MURDO MACKENZIE, M.B., B.S., M.R.C.P.  
*Junior Assistant Physician*—DAVID ROBERTSON, M.D.  
*Pathologist*—CLEMENT LOVELL, M.C., M.D.

### CONSULTING STAFF

*Surgeon*—STANFORD CADE, F.R.C.S.  
*Gynaecologist*—THOMAS GEORGE STEVENS, M.D., F.R.C.S.  
*Ophthalmologist*—J. FRANCIS CUNNINGHAM, F.R.C.S.  
*Laryngologist*—W. MAYHEW MOLLISON, F.R.C.S.  
*Anæsthetist*—CECIL M. HUGHES, M.B., B.S.  
*Dental Surgeon*—ARTHUR BULLEID, M.R.C.S., L.D.S.  
*Neurologist*—C. C. WORSTER-DROUGHT, M.A., M.D., M.R.C.P.  
*Radiologist*—E. ULYSSES WILLIAMS, O.B.E., M.R.C.S., L.R.C.P.  
*Director of Psychological Dept.*—WILLIAM BROWN, M.A., M.D., D.Sc., F.R.C.P.  
*Assistant Ditto*—R. J. BARTLETT, M.Sc.  
*Director of Physiotherapy Dept.*—ALASTAIR MACGREGOR, M.B., C.M.

Patients of the educated classes, in a presumably curable condition, are eligible for admission, and those who can contribute 5 guineas weekly towards the cost of treatment and maintenance may be received as vacancies arise. The Committee will also consider applications for admission at lower rates and in certain cases will be prepared to admit patients free of charge. With a view to the early treatment of eligible cases  
Voluntary or Uncertified Patients are admitted.

*For forms or further particulars apply to the Physician Superintendent.*

# NORTHUMBERLAND HOUSE,

## GREEN LANES, FINSBURY PARK, N.4.

Telephone: NORTH 0888.

Telegraphic Address: "SUBSIDIARY, LONDON."

*A Home for the Treatment of Patients of  
both sexes suffering from Mental Illnesses*

Conveniently situated four miles from Charing Cross. Nearest Stations, Finsbury Park (Piccadilly and Moorgate St. Underground, and G.N. Railways). Cars and Buses pass the Gate.

Six acres of ground, highly situated, facing Finsbury Park. Private villas. Suites of rooms. Convalescent Home: KEARSNEY COURT, DOVER. Voluntary Boarders received without certificates. Terms from 4½ Guineas per week.

For further particulars apply to the Medical Superintendent.

# ST. PATRICK'S HOSPITAL,

## DUBLIN.

**For the treatment of Nervous and Mental Diseases.**

FOUNDED BY JONATHAN SWIFT, D.D., 1745.

THIS historic Institution, the first of its kind in Ireland, has been completely modernized and considerably enlarged. It affords every facility for the treatment of ladies and gentlemen suffering from nervous and mental diseases.

There are branch establishments situated at St. Edmondsbury, Lucan, within a beautifully wooded demesne of about 400 acres. A portion of the demesne is worked as a home farm, from which daily supplies of milk, mutton, poultry and vegetables, etc., are delivered to the three hospitals by means of a motor van. Extensive gardens and recreation grounds. Frequent drives by motor.

### MEDICAL STAFF.

Medical Superintendent - RICHARD R. LEEPER, F.R.C.S.I.

Assistant Medical Officers - ROBERT THOMPSON, M.B., D.P.M.

ROBERT TAYLOR, L.R.C.P. and S.I.

GEOFFREY J. HARRISON, L.R.C.P. & S.I.

Clinical Pathologist - ROBERT H. MICKS, M.D., F.R.C.P.I.

Visiting Physician - RICHARD A. HAYES, M.D., F.R.C.S.I.

Dentist - ALBERT F. CARBURY, L.D.S.I.

Rates of maintenance vary according to the nature of each case and the accommodation required.

For forms and further particulars apply to Mr. A. E. Coe, Registrar, St. Patrick's Hospital, James Street, Dublin; or, in case of urgency, to the Medical Superintendent.

Telephones: Dublin 21095. Lucan 21.



# ST. ANDREW'S HOSPITAL

## *For Mental Disorders*

## NORTHAMPTON

FOR THE UPPER AND  
MIDDLE CLASSES ONLY.

*President:* The Most Hon. the  
MARQUESS OF EXETER, C.M.G., A.D.C.

*Medical Superintendent:* DANIEL F. RAMBAUT, M.A., M.D.

THIS Registered Hospital is situated in 120 acres of park and pleasure grounds. Voluntary Patients who are suffering from incipient Mental Disorders, or who wish to prevent recurrent attacks of Mental trouble; Temporary Patients, and Certified Patients of both sexes, are received for Treatment. Careful clinical, biochemical, bacteriological, and pathological examinations. Private rooms with special nurses, male or female, in the Hospital or in one of the numerous villas in the grounds of the various branches can be provided.

### WANTAGE HOUSE.

This is a Reception Hospital, in detached grounds with a separate entrance, to which patients can be admitted. It is equipped with all the apparatus for the most modern treatment of Mental and Nervous Disorders. It contains special departments for hydrotherapy by various methods, including Turkish and Russian baths, the prolonged immersion bath, Vichy Douche, Scotch Douche, Electrical baths, Plombières treatment, etc. There is an Operating Theatre, a Dental Surgery, an X-ray Room, an Ultra-violet Apparatus, and a Department for Diathermy and High Frequency treatment. It also contains Laboratories for biochemical, bacteriological, and pathological research.

### MOULTON PARK.

Two miles from the Main Hospital there are several branch establishments and villas situated in a park and farm of 650 acres. Milk, meat, fruit, and vegetables are supplied to the Hospital from the farm, gardens and orchards of Moulton Park. Occupation therapy is a feature of this branch, and patients are given every facility for occupying themselves in farming, gardening, and fruit growing.

### BRYN-Y-NEUADD HALL.

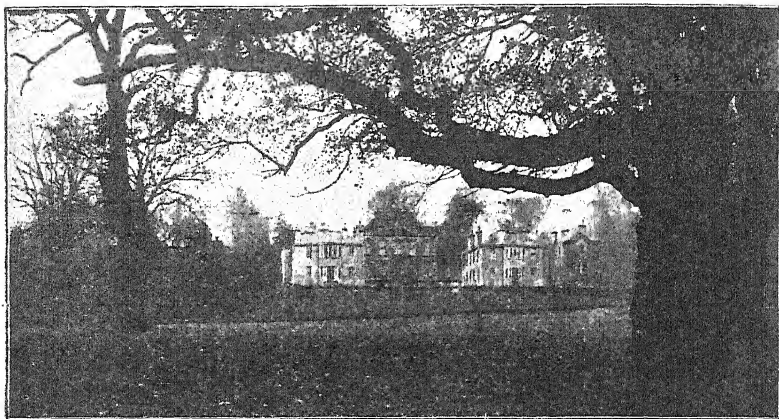
The Seaside House of St. Andrew's Hospital is beautifully situated in a Park of 330 acres, at Llanfairfechan, amidst the finest scenery in North Wales. On the North-West side of the Estate a mile of sea coast forms the boundary. Patients may visit this branch for a short seaside change or for longer periods. The Hospital has its own private bathing house on the seashore. There is trout-fishing in the park.

At all the branches of the Hospital there are cricket grounds, football and hockey grounds, lawn tennis courts (grass and hard court), croquet grounds, golf courses, and bowling greens. Ladies and gentlemen have their own gardens, and facilities are provided for handicrafts such as carpentry, etc.

For terms and further particulars apply to the MEDICAL SUPERINTENDENT (Telephone No. 56 Northampton), who can be seen in London by appointment.

## **New Saughton Hall, POLTON, MIDLOTHIAN.**

The only Private Hospital for the Treatment of Mental Cases in Scotland.



**NEW SAUGHTON HALL**, which takes the place of Saughton Hall, established in 1798, is situated seven miles south of Edinburgh, in the beautiful neighbourhood of Hawthornden and Rosslyn, and is surrounded by picturesque and well-timbered pleasure grounds extending to 125 acres. There is a frequent motor bus service from Edinburgh to Loanhead.

**RAILWAY STATIONS.**—Polton five minutes; and Loanhead, ten minutes' walk from the Institution—reached in half-an-hour from the Waverley Station, Edinburgh. Telephone: 4 Loanhead. Forms of Admission for Voluntary or Certified Cases, full instructions, etc., can be obtained on application to the Resident Medical Supt., **JAMES H. SKEEN, M.B.**

Terms from £157 to £525 per annum, according to requirements.

# **THE COPPICE, NOTTINGHAM.**

## ***Hospital for Mental Diseases.***

**T**HIS Institution for the reception of **PRIVATE PATIENTS** of both sexes of the **Upper and Middle Classes** only, at moderate rates of payment, is beautifully situated in its own grounds about two miles from Nottingham, and from its singularly healthy and pleasant position, and the comfort of its internal arrangements, affords every facility for the **Relief and Cure of those Mentally Afflicted**. Divine Service is held in the Institution every Sunday by the Chaplain, who also visits the Patients. Carriage and motor exercise is provided.

*Voluntary Boarders admitted without Certificates.*

Tel. No.  
64117.

FOR TERMS, ETC., APPLY TO

**DR. HUNTER, Physician-Superintendent.**

# **BETHEL HOSPITAL**

*For Mental and Nervous Disorders,*  
**NORWICH**

ESTABLISHED A.D. 1713.

THIS Institution is a Registered Hospital, managed by a Board of Governors, who have no pecuniary interest in its success, but whose sole object is to promote the comfort and well-being of the Patients. The Hospital is arranged for both sexes.

Voluntary Patients are admitted without certificates.

CONSULTING PHYSICIAN:

SAMUEL J. BARTON, M.D.

RESIDENT MEDICAL SUPERINTENDENT:

SAVILLE J. FIELDING, M.B.

CLERK TO THE GOVERNORS:

B. F. HORNER, QUEEN STREET, NORWICH.

MATRON:

MISS F. N. HENRY.

APPLICATION FOR ADMISSION TO BE MADE TO THE  
Resident Medical Superintendent - **BETHEL HOSPITAL, NORWICH.**

## **New Treatment of all Nervous Complaints**

and

of all derangements of glands  
with internal secretion and

**the correct Diagnosis of the same**

through the examination of  
the blood for hormones.

Pamphlet containing detailed information together with a communication  
from the undersigned will be forwarded to any Medical man. Please  
address to:

**Dr. med. et phil. Detmar, Nerve Spezialist**  
**Munich — Theatiner-Street 18 (Bavaria)**

# THE WARNEFORD

## HEADINGTON HILL, OXFORD.

**A Registered Hospital for the Care & Treatment of  
both Sexes of the Upper and Middle Classes, when  
suffering from Nervous and Mental Disorders. . .**

*President*—THE RIGHT HON. THE LORD SAYE AND SELE.

*Chairman of the Committee*—

F. A. DIXEY, Esq., F.R.S., D.M., Fellow of Wadham College.

*Vice-Chairman*—

D. S. MARGOHOUGH, Esq., D.Litt., F.B.A., Fellow of New College.

THIS HOSPITAL is pleasantly situated on Headington Hill, on the outskirts of the City of Oxford. The grounds, which extend to over 120 acres, command extensive views of the surrounding country.

The buildings are arranged, so far as is compatible with the requirements of a Mental Hospital, in the manner of an ordinary private residence.

**TEMPORARY PATIENTS. VOLUNTARY PATIENTS ARE RECEIVED.**

*For Terms and further particulars, apply to the—*

*Telephone—*

**Physician Superintendent, ALEX. W. NEILL, M.D. 2063 OXFORD.**

# CHEADLE ROYAL

## CHEADLE, CHESHIRE.

**A Registered Hospital for MENTAL DISEASES,  
and its Seaside Branch, GLAN-Y-DON, Colwyn Bay, N. Wales.**

THE object of this Hospital is to provide the most efficient means for the treatment and care of those of the Upper and Middle Classes suffering from MENTAL and NERVOUS DISEASES. The Hospital is governed by a Committee appointed by the Trustees of the Manchester Royal Infirmary.

**VOLUNTARY, TEMPORARY and CERTIFIED PATIENTS RECEIVED.**

**For Terms and further information apply to the MEDICAL SUPERINTENDENT.**

*Telephone - Galley 2231.*

# Littleton Hall, Brentwood

— ESSEX —

A limited number of Ladies received, with or without certificate. Large grounds. 18 miles from London. 1 mile from station. Full particulars from DR. HAYNES. *Telephone: Brentwood 45.*

# HOLLOWAY SANATORIUM

## VIRGINIA WATER.

---

*A Registered Hospital for the  
Treatment of MENTAL DISORDERS  
of the EDUCATED CLASSES.*

---

THIS Institution is situated in a beautiful and healthy locality within easy reach of London. It is fitted with every comfort. Patients can have Private Rooms and Special Attendants, as well as the use of General Sitting Rooms, at moderate rates of payment. Voluntary Patients can be admitted.

There is a BRANCH ESTABLISHMENT at CANFORD CLIFFS, BOURNEMOUTH, where Patients can be sent for a change and provided with all the comforts of a well-appointed home.

---

*For Terms, apply to the RESIDENT MEDICAL SUPERINTENDENT,  
St. Ann's Heath, Virginia Water, SURREY.*

---

# BOREATTON PARK

THIS ESTABLISHMENT, which was founded by the late W. H. O. SANKEY, M.D., F.R.C.P., for the reception of a limited number of

**LADIES & GENTLEMEN MENTALLY AFFLICTED,**

---

— is now conducted by his son, —  
E. H. O. SANKEY, M.A., M.B., B.C. Cantab.

The Ladies' Division is directly supervised by MISS SANKEY.

The Mansion stands high, among handsomely laid-out gardens in the midst of a picturesque deer park (about 40 head of deer are kept), and commands a magnificent view of Welsh Mountain scenery. Grounds extend to over 200 acres.

Carriages, horses, motor, lawn-tennis, golf, and fishing are provided.

Arrangements can be made to enable friends of patients to reside in the House as Boarders if so desired.

The House is situate about ten miles from Shrewsbury, within easy distance of Baschurch Station, G.W.R., whither carriages can be sent at any time for visitors.

---

Letters and Telegrams should be addressed to—

**Dr. SANKEY, Boreatton Park, Baschurch, SALOP.**

# KINGSDOWN HOUSE

## BOX (Near BATH).

*Telephone: No. 2 Box*

**FOR THE TREATMENT OF DISEASES  
OF THE BRAIN AND NERVOUS SYSTEM**

THIS House is situate 450 feet above sea level, and commands extensive views of the surrounding country.

Special accommodation for Patients of the Voluntary Class, which is encouraged.

ACCESS—Box Station (G.W.R.); Bath Stations (Midland and G.W.R.) twenty minutes from the house.

*For terms, etc., apply to:—*

**Dr. H. C. MacBRYAN or MEDICAL SUPERINTENDENT**  
*at the above,*

Or at 17 BELMONT, BATH - - *Telephone: No. 3136 Bath*

# HEIGHAM HALL

Consulting Physician: **NORWICH.** *Telephone: Norwich 80.*  
Dr. G. S. POPE. *Telegrams: "Small, 80 Norwich."*

Private Home for the cure and treatment of a limited number of Ladies and Gentlemen suffering from Nervous and Mental Illness.

About two and a half hours from London by express train, L.N.E.R., and in connection with the Midlands by Midland and Great Northern Joint Line.

The mansion, surrounded by 14 acres of well-wooded grounds, is furnished as a private residence, and nothing suggests confinement, the safety of patients being ensured by a large staff of experienced nurses. Any modern therapeutic measures can be undertaken in suitable cases. Private Suites of Rooms with special nursing available.

Seaside quarters are available when desired, and all amusements conducive to recovery are provided.

The Chaplain conducts Service every Sunday, and patients attend the Parish Church.

Voluntary patients, temporary patients, and patients under certificates are admitted for treatment.

FEES: from 4 guineas a week upwards according to requirements. Vacancies occasionally exist at reduced rates for ladies and gentlemen on the recommendation of the patient's own physician.

Apply to Dr. J. A. SMALL, Medical Superintendent and Resident Licensee.

# Bishopstone House, Bedford

**PRIVATE HOME for MENTALLY AFFLICTED LADIES.**

Ten only received.

Apply, Medical Officer or Mrs. PELE.

*Telephone: 2708.*

# HAYDOCK LODGE

## NEWTON-LE-WILLOWS, LANCASHIRE

Telegraphic Address: "STREET, ASHTON-IN-MAKERFIELD" (two words only).  
Telephone: ASHTON-IN-MAKERFIELD 11

### A PRIVATE MENTAL HOSPITAL FOR THE TREATMENT OF NERVOUS AND MENTAL DISORDERS EITHER VOLUNTARILY OR UNDER CERTIFICATE.

**H**AYDOCK LODGE is a large Country Mansion especially adapted for the Care and Treatment of Persons with Nervous and Mental Disorders, having been enlarged and rebuilt on plans sanctioned and approved by the Commissioners in Lunacy. It is charmingly situated in a healthy and retired neighbourhood, standing in its own well-timbered Park, Gardens, and Farm of 300 acres, with provision and facilities for Tennis, Cricket, Football, Bowls, Croquet and Golf.

Newton-le-Willows is a first-class station on the L. M. & S. Rly. (midway between Liverpool and Manchester), where conveyances are always to be had.

Motors are kept for the use of Patients, and those whose condition will allow and whose friends desire it, spend some time annually at the seaside. Voluntary Boarders are received without Certificate, written application for admittance being all that is required.

Haydock Lodge has also associated with it an establishment at **GRETA BANK** (for ladies only), in the Craven district of Yorkshire, near Ingletton.

TERMS, PROSPECTUS and INFORMATION may be obtained on application to the Medical Superintendent.

Consultations can be arranged by appointment.

Resident Medical Licensee.....J. C. WOOTTON, L.R.C.P.Lond., M.R.C.S.Eng.  
Medical Superintendent.....F. M. SEAL, M.B., M.R.C.S., L.R.C.P.

## THE LAWN, LINCOLN.

**A Registered Hospital  
founded in 1819 for the  
Care and Treatment of  
Private and Voluntary  
Patients suffering from  
Mental and Nervous  
Disorders, including  
post-encephalitic con-  
ditions in adults.**

**T**HE Hospital combines the advantages of town and country, a maximum of fresh air and sunshine being afforded by its situation in large gardens on the southern slope of the hill near the Cathedral, while the centre of the town is within easy access. Open-air treatment is provided on a glass-roofed verandah permeable to ultra-violet rays, and special facilities for Psychotherapy are offered to suitable and co-operative Patients.

FOR TERMS AND PARTICULARS APPLY TO THE MEDICAL SUPERINTENDENT.

## CITY MENTAL HOSPITAL PORTSMOUTH.

Accommodation is provided for Ladies and Gentlemen in Two Detached Villas, at a charge from **3 guineas** upwards, including all necessaries except clothing.

APPLY - MEDICAL SUPERINTENDENT.

# CAMBERWELL HOUSE

33, PECKHAM ROAD, LONDON, S.E.5.

Telegrams :  
"Psycholia, London."

For the Treatment of  
**MENTAL DISORDERS**

Telephone :  
Rodney 4731-2.

ALSO completely Detached Villas for mild cases with private suites if desired. Voluntary patients received. Twenty acres of grounds. Hard and Grass Tennis Courts, Bowls, Croquet, Squash Racquets, and all indoor amusements including Wireless and other Concerts. Occupational Therapy, Physical Drill and Dancing Classes, X-ray and Actino Therapy, Prolonged Immersion Baths, Operating Theatre, Pathological Laboratory, Dental Surgery and Ophthalmic Department, Chapel.

**Senior Physician: Dr. HUBERT JAMES NORMAN,**  
assisted by three Medical Officers, also Resident, and visiting Consultants.

An Illustrated Prospectus may be obtained upon application to the Secretary.

**HOVE VILLA, BRIGHTON—Convalescent Branch of the above.**

# PECKHAM HOUSE

112, Peckham Road, LONDON, S.E.15.

Telegrams: "ALLEVIATED, LONDON." Telephone: Rodney 4741, 4742.

THE above House, which was established in 1826, is an **INSTITUTION FOR THE CARE AND TREATMENT OF PERSONS SUFFERING FROM MENTAL DISEASES AND NERVOUS DISORDERS.** Both Certified, Voluntary and Temporary patients are received. Separate houses for the treatment and accommodation of special cases adjoin the Institution. There is a Seaside Branch, Kearsney Court, near Dover, to which patients may be sent for treatment or on holiday. Motor and carriage exercise is provided as required. Patients can avail themselves of a course of physical drill. Tennis courts. Entertainments, dances, and indoor amusements held throughout the year.

Illustrated Prospectus and further particulars can be obtained from the **MEDICAL SUPT.**

Telephone: HOUNSLOW 0158.

# WYKE HOUSE

ISLEWORTH, MIDDLESEX.

A Private  
Mental Hospital  
for Ladies and  
Gentlemen.

Conveniently situated in quiet rural surroundings in Syon Lane, about a quarter of a mile to the north of the new Great West Road.

Stations: OSTERLEY (District Railway); ISLEWORTH (Southern Railway).

For Terms and Further Particulars apply to the Resident Physician:—

G. W. SMITH, O.B.E., M.B., Ch.B. (Edin.)

Consulting Rooms: 57 GROSVENOR STREET, W.1. (By Appointment).

# CITY OF LONDON MENTAL HOSPITAL, Near DARTFORD, KENT.

Under the management of a Committee of the Corporation of the City of London.

**LADIES and GENTLEMEN** received for treatment under Certificates and without Certification, as either **Voluntary or Temporary Patients**, at a **WEEKLY FEE of TWO GUINEAS** and upwards. An Illustrated Booklet giving full particulars can be obtained from the **Medical Superintendent.**

The Institution is within two miles of Dartford Station, on the Southern Railway, with frequent electric train service, and is about 16 miles from London. Trams and Motor Omnibuses pass the door.

Telephone: DARTFORD 57.

Telegraphic Address: **STONE HOUSE, DARTFORD, KENT.**



# DERBY MENTAL HOSPITAL

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## ALBANY HOUSE, a Detached Block for FEMALE PRIVATE PATIENTS.

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TERMS: 2 GUINEAS PER WEEK and upwards. This Villa is distinct from the main building, and has separate recreation grounds.

*For further particulars, apply to the Medical Superintendent,*

**DR. JOHN BAIN, ROWDITCH, DERBY.**

---

## THE GRANGE, Near Rotherham

A SANATORIUM OF THE HIGHEST CLASS FOR THE

### CARE & CURE OF MENTAL INVALIDS (Ladies).

Resident Physician: G. E. MOULD, M.R.C.S. Eng., L.R.C.P. Lond.,  
Consulting Physician for Mental Diseases to the Sheffield Royal Hospital.

THE House is a spacious Family Mansion, with extensive pleasure grounds, including good Croquet and Tennis Grounds, and an immense Park, containing Private Drives and Walks of several miles in extent. It is situated in the heart of the famous Robin Hood Country (5 miles from Sheffield, 4 from Rotherham) and is surrounded by beautiful scenery, and an atmosphere free from smoke and impurity. Situation dry and healthy. The arrangements are of a domestic character. The Proprietors welcome visits from the usual Medical Attendant of the Patient during her residence. Certified Voluntary and Temporary Patients received. The Rev. R. T. C. Slade, Mus. Bac., late Vicar of Thorpe-Hesley, acts as Chaplain, and conducts regular Services.

The Resident Physician may be seen at the Grange; or at 342 Glossop Road, Sheffield, by appointment. Telephone: Sheffield No. 40030.

GRANGE LANE STATION (L. & N.E. Railway) is within a quarter of a mile of the Grange, and may be reached via Sheffield or Barnsley direct; or via Rotherham, changing at Tinsley.

FOR TERMS, FORMS, &c., APPLY TO THE RESIDENT PHYSICIAN.

---

## Shaftesbury House,

### FORMBY-BY-THE-SEA.

Telephone: No. 8 FORMBY.

Near LIVERPOOL.

THIS HOUSE, specially built and licensed for the Care and Treatment of a limited number of LADIES and GENTLEMEN suffering from

### MENTAL or NERVOUS BREAKDOWN,

is delightfully situated between Liverpool and Southport in well-wooded grounds. Outdoor and indoor amusements and occupation provided. Voluntary and Certified Patients received. Ladies also admitted as "Temporary Patients" without certification.

TERMS MODERATE.

Apply RESIDENT PHYSICIAN.

# SPRINGFIELD HOUSE

Near BEDFORD

Telephone No. 3417

## For Mental Cases, with or without Certificates

*Ordinary Terms, Five Guineas per week*  
(including Separate Bedrooms for all suitable Cases, without extra charge.) :: ::

For forms of admission, etc., apply to the Resident Physician, CEDRIC W. BOWER, as above, or at 5, DUCHESS STREET, PORTLAND PLACE, W.1, on Tuesdays, from 4 p.m. to 5 p.m.

## The Old Manor, Salisbury

Telephone 51

**A PRIVATE HOSPITAL FOR THE CARE AND  
TREATMENT OF THOSE OF BOTH SEXES  
SUFFERING FROM MENTAL DISORDERS.**

Extensive grounds. Detached Villas. Chapel Garden  
and dairy produce from own farm. Terms very moderate.

### Convalescent Home at Bournemouth

standing in 12 acres of Ornamental Grounds, with Tennis  
Courts, etc. Patients or Boarders may visit the above, by  
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*Illustrated Brochure on application to the Med. Supt., The Old Manor, Ltd., Salisbury.*

## CLARENCE LODGE

CLARENCE ROAD, CLAPHAM PARK, S.W.4.

A LIMITED number of LADIES suffering from MENTAL and NERVOUS  
DISORDERS are received for treatment under a Specialist. The House stands  
in large grounds. Telephone: Brixton 0194

*For further particulars see Illustrated Prospectus from Resident Licensee: Miss THWAITES.*

## EAST SUSSEX COUNTY MENTAL HOSPITAL

Accommodation is provided for PRIVATE VOLUNTARY, TEMPORARY,  
and CERTIFIED PATIENTS resident in the County. The Estate com-  
prises 400 acres, and is situated on high ground nine miles north  
of Eastbourne, and four miles west of Pevensey Bay. There is a  
separate detached block for Children. *For particulars apply to—*

**The Resident Physician and Medical Supt., The Hospital, HELLINGLY.**

# ASHWOOD HOUSE,

## KINGSWINFORD, STAFFORDSHIRE.

**An old-established and modernized Institution for the Medical Treatment of Ladies and Gentlemen Mentally Afflicted.**

THE House, pleasantly situated, stands in picturesque grounds of forty acres in extent, with a surrounding country noted for the beauty of its walks and drives. The climate is genial and bracing. Occupation, indoor and outdoor amusements, and carriage and other exercise amply provided.

TERMS vary according to requirements as to accommodation, special attendance, etc.

TELEPHONE 19, KINGSWINFORD.

Railway Stations: Stourbridge Junction (G.W.R.),  $\frac{3}{4}$  miles; Dudley (L.M. & S.R.), 4 miles; Wolverhampton (G.W.R. or L.M. & S.R.), 7 miles.

FOR FURTHER PARTICULARS APPLY TO THE MEDICAL SUPERINTENDENT.

# FARNHAM HOUSE & MARYVILLE

## FINGLAS, Co. DUBLIN.

**PRIVATE HOSPITALS for MENTAL AND NERVOUS ILLNESS, including the ALLIED DISORDERS OF ALCOHOLISM and THE DRUG HABIT.**

IDEALLY situated within two miles of the City and in a health-inducing district. Voluntary boarders received without medical certificates.

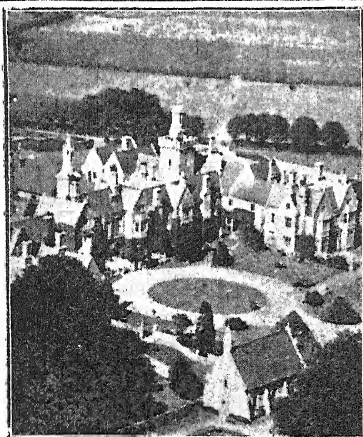
A beautiful seaside residence in a park of 600 acres, with a private bathing beach, is available for suitable cases.

Experienced staff; modern treatment. Interviews can be arranged at 42, FITZWILLIAM PLACE, DUBLIN.

Apply: H. R. C. RUTHERFORD, F.R.C.S.I., D.P.H.,

PHONE: FINGLAS II.

Medical Superintendent.



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## Mental Hospital

Near STAFFORD.

Chairman of the Committee of Management:

THE RIGHT HONOURABLE

THE EARL OF DARTMOUTH.

Beautifully situated in a high and healthy position, with extensive grounds. The hospital is devoted to the care and treatment of the mentally afflicted of the upper and middle classes. Voluntary patients are received. Terms on application. Private rooms with special attendants, can be arranged.

For further particulars, apply to—

Dr. R. MACDONALD, O.B.E., M.D., D.P.M.

Telephone: Stafford 14.

# BAILBROOK HOUSE, BATH

For the Care and Treatment of  
Ladies & Gentlemen suffering from  
- Nervous or Mental Breakdown. -

Special Attention is given to the Curative Treatment of Early Cases,  
also to Fresh Air Treatment and Occupational Therapy.

Apply S. J. GILFILLAN, O.B.E., M.B., *Resident Physician.*

Telephone : BATHEASTON 8189.

## VOLUNTARY PATIENTS RECEIVED

Trams to Bathford pass the entrance gates of Bailbrook House.

Inclusive Terms from 5 Guineas per week.

# PLYMPTON HOUSE

PLYMPTON, DEVON

ESTABLISHED 1834

PLYMPTON HOUSE is licensed for the accommodation of both sexes,  
and is well adapted by its position and appointments for the **Medical  
Treatment and Care of Patients of the Upper and Middle Classes, suffering  
from MENTAL DISEASE.**

**TERMS ON APPLICATION.**

*Letters and Telegrams :*

Telephone: No. 2 PLYMPTON.

**DR. J. C. NIXON, PLYMPTON**

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For the Cure and Care of Patients of the Upper Class suffering from  
Mental and Nervous Diseases and Abuse of Drugs.

Telephone: Drumcondra No. 3.

Telegrams: "Eustace," Glasnevin.

**These Hospitals are built on the Villa System, and there are also  
cottages on the demesne (130 acres), which is 150 ft. above the sea level  
and commands an extensive view of the Dublin Mountains and Bay.**  
*Voluntary Patients admitted without Medical Certificates.*

For further information apply for illustrated prospectus, etc., to the Resident Medical  
Superintendent: Dr. WILLIAM NIELSON EUSTACE, Hampstead, Glasnevin; or at the Office, 41,  
Grafton Street, Dublin. Telephone: Dublin No. 1224. On Mondays, Wednesdays, and Fridays,  
at 2.30 p.m.

# STRETTON HOUSE

CHURCH STRETTON, SHROPSHIRE.

A PRIVATE HOME for the treatment of gentlemen suffering from Mental and  
Nervous illness, including the allied Disorders of Alcoholism and the Drug Habit.  
All types of early Mental and Nervous Cases are received without certificates as  
Voluntary Patients. Bracing hill country.

Apply to MEDICAL SUPERINTENDENT.

Phone 10 P.O. Church Stretton.

# BARNWOOD HOUSE

## GLOUCESTER

A REGISTERED HOSPITAL for the CARE and TREATMENT of LADIES and GENTLEMEN suffering from NERVOUS and MENTAL DISORDERS.

WITHIN two miles of the G.W.R. and L.M. & S. Railway Stations at Gloucester, the Hospital is easily accessible by Rail from London and all parts of the United Kingdom. It is beautifully situated at the foot of the Cotswold Hills, and stands in its own grounds of over 280 acres. Voluntary Boarders of both sexes are also received for Treatment.

Special accommodation for LADY VOLUNTARY BOARDERS is also provided at the MANOR HOUSE, which has its own private grounds and is entirely separate from the main Hospital.

For particulars as to Terms, etc., apply to **ARTHUR TOWNSEND, M.D.**,  
Telephone: No. 7 BARNWOOD. *Resident Superintendent.*

# THE FLOWER HOUSE

## BECKENHAM LANE, S.E.6

Telephone: LEE GREEN 1103

8 miles from London.

A PRIVATE HOME of the highest class for *Gentlemen* suffering from Mental and Nervous Disorders, both under certificates or as Voluntary Patients.

A beautifully furnished old Family Mansion thoroughly modernized and up to date.

Twenty-five acres of well-timbered grounds, containing unrivalled flower gardens, cricket and football fields, croquet, tennis and bowls.

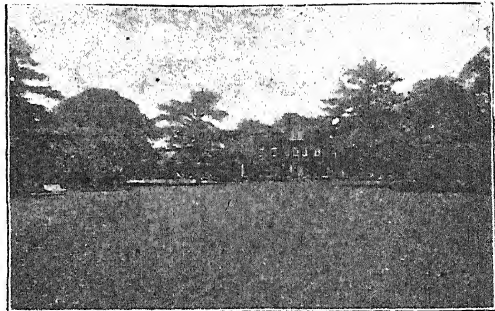
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Special suites for suitable patients, in new annex, consisting of private sitting room, bed room, attendant's room (if necessary) and private bath room and lavatory.

Station, BECKENHAM HILL, 8 minutes, and Beckenham Junction.

Tram 54 from Victoria to Southend Village, which is 2 minutes' walk from Flower House.

Motor Buses 54, 47, 500.



For terms and further particulars, apply  
**W. F. UMNEY, M.D.**, Medical Superintendent, or  
**Mrs. A. BECKETT**, Resident Licensee.

# THE

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## DIGBYS, near EXETER.

The above Hospital, situated in healthy country, three miles from Exeter, RECEIVES PRIVATE PATIENTS OF BOTH SEXES.

**FEES: TWO GUINEAS**  
per week.

Particulars on application to the  
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TOOTING BEC COMMON,  
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# Private Mental

# Hospital

FOR LADIES & GENTLEMEN.

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STREATHAM 0524.

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**A Large Detached Villa**, in connection with the Cheshire County Mental Hospital, Macclesfield, for the **RECEPTION OF PRIVATE PATIENTS** of both sexes. **FEES** from £1 18s. 6d. upwards, according to accommodation.

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*Telephone : Macclesfield 2617.*

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**CHRISTCHURCH ROAD, STREATHAM HILL, S.W.2.**

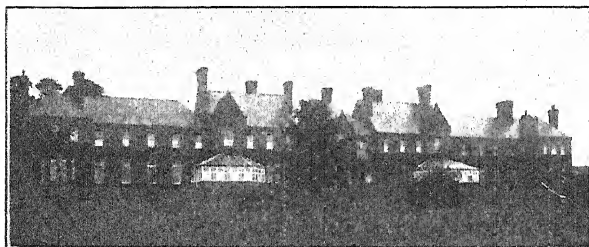
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**A Private Hospital for the Care and Treatment of Ladies suffering from Mental and Nervous Disorders.**

The Mansion, with Annexe, stands on an elevated site in 12½ acres of well wooded grounds. Special facilities for Voluntary Patients in Mansion. Visits by own Medical Attendant encouraged.

For Terms apply - J. H. EARLS, M.D., Resident Physician.

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OF MENTAL  
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Fees 3 Guineas weekly.

Particulars from the MEDICAL SUPT.

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*For Terms, etc., apply to the Medical Superintendent—*

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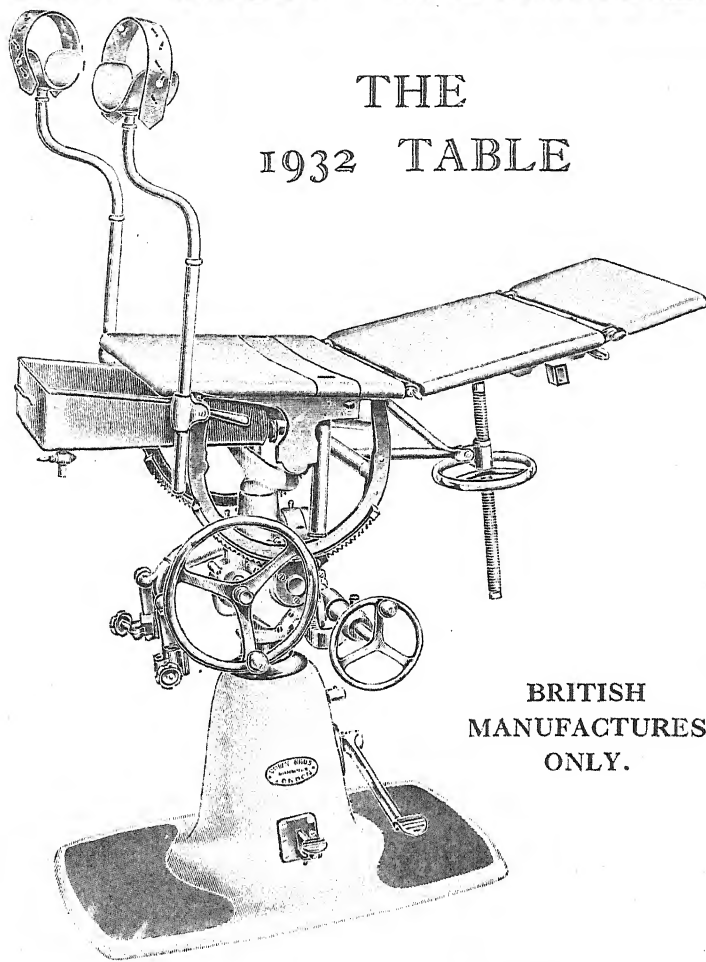
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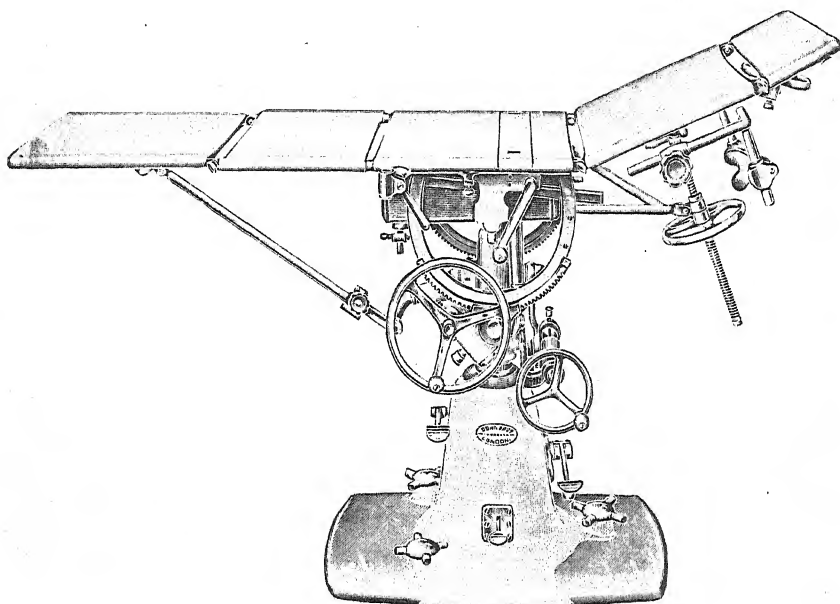
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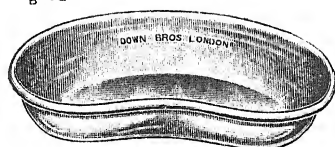
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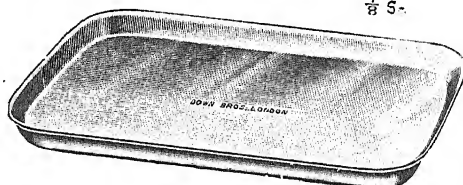
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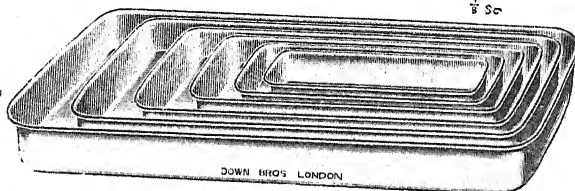
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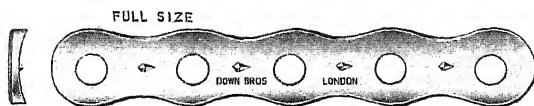
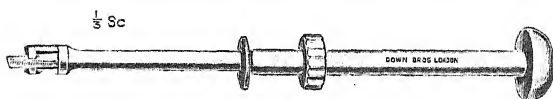
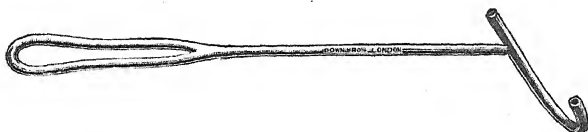
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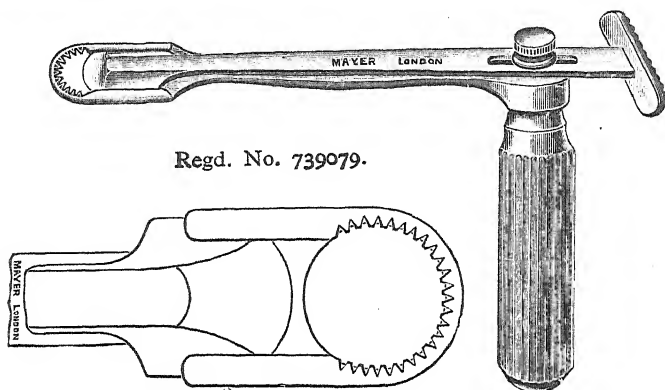
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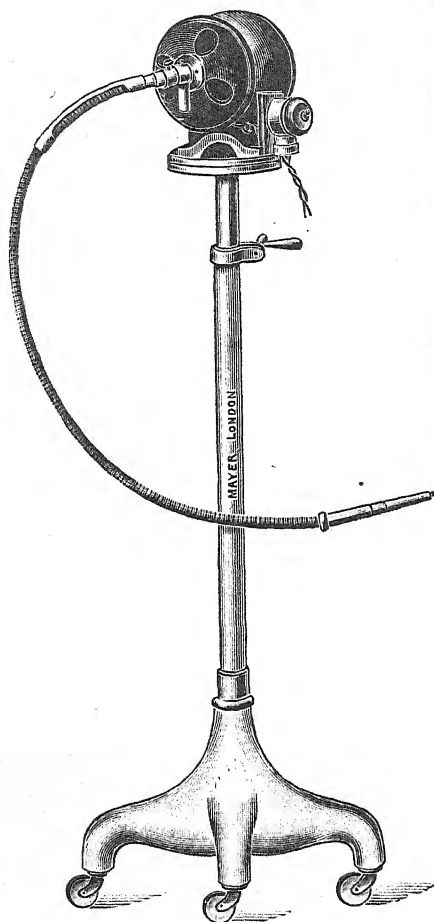
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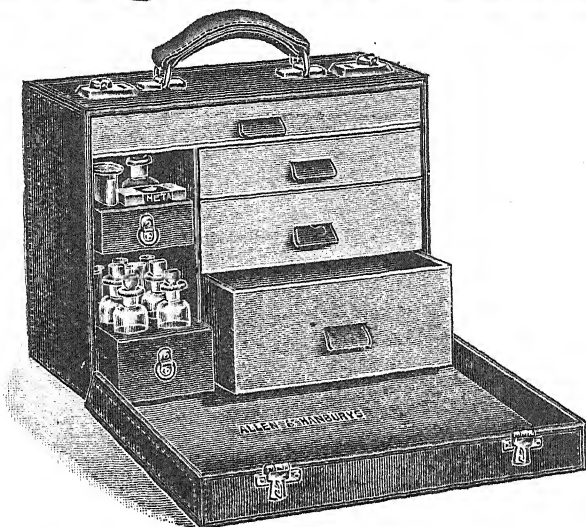
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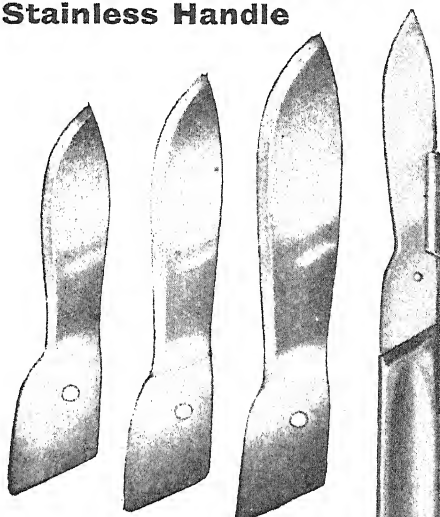
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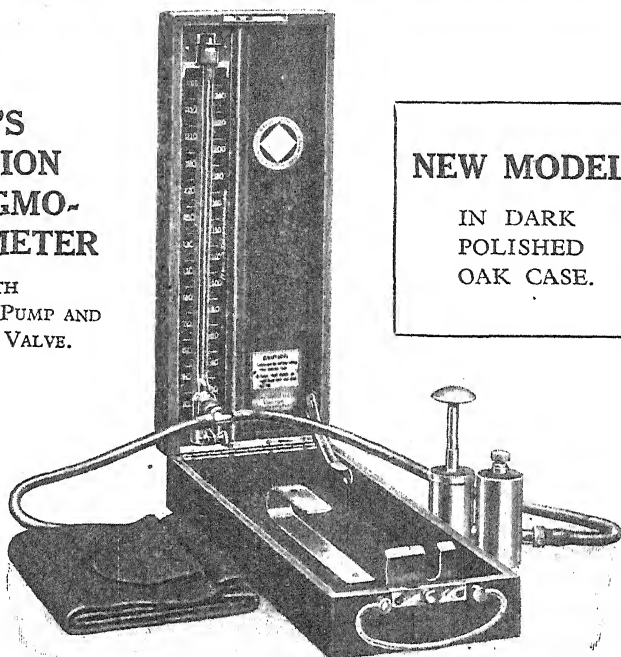
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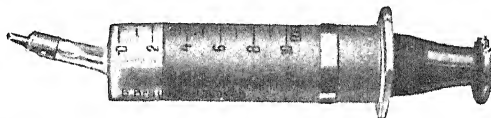


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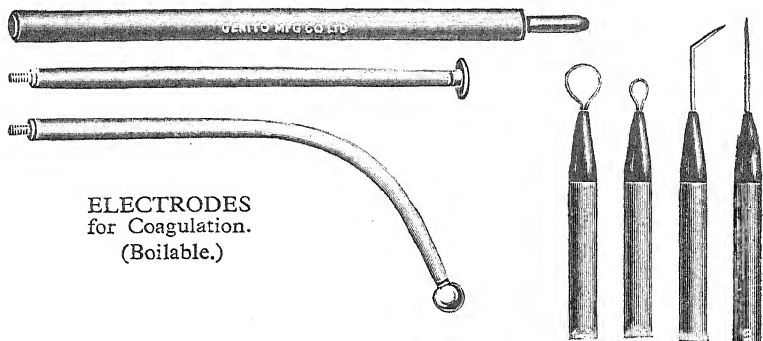
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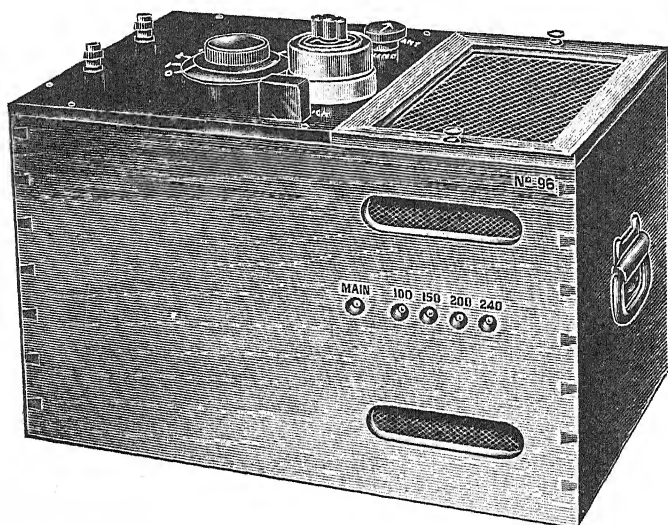
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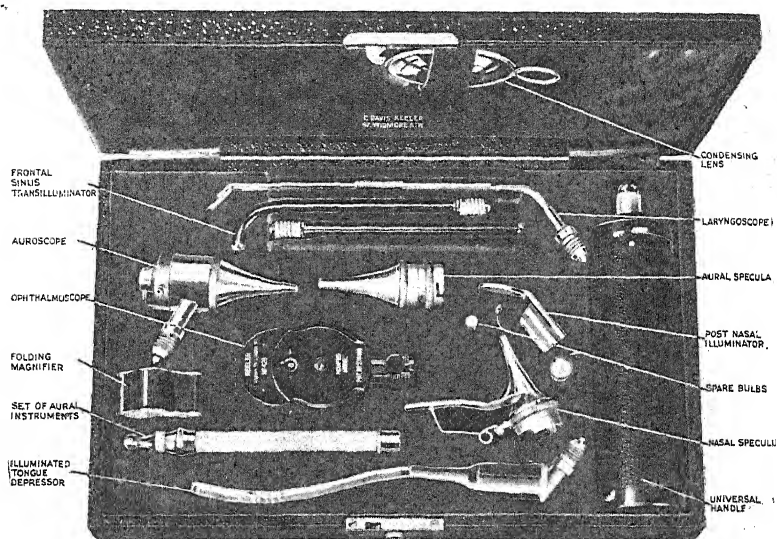
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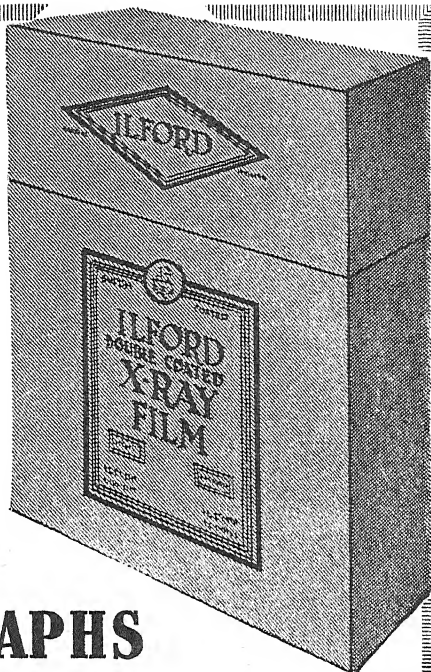
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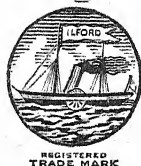


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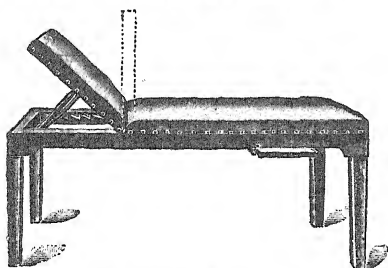
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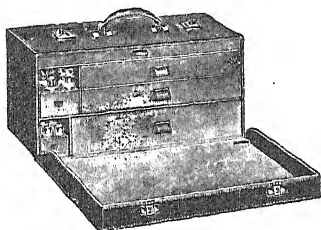
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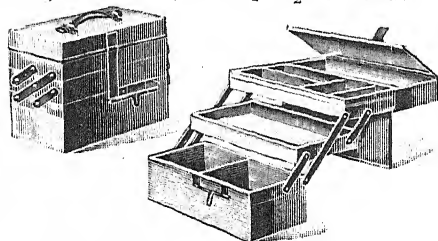
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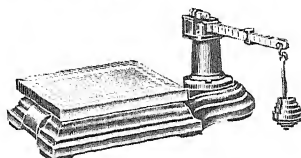
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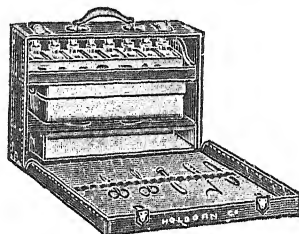


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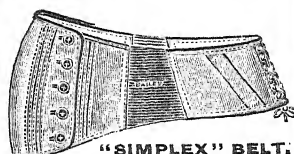
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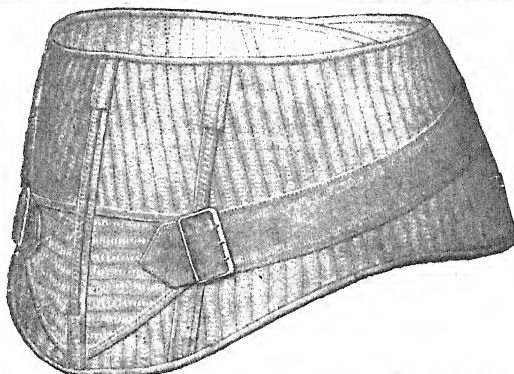
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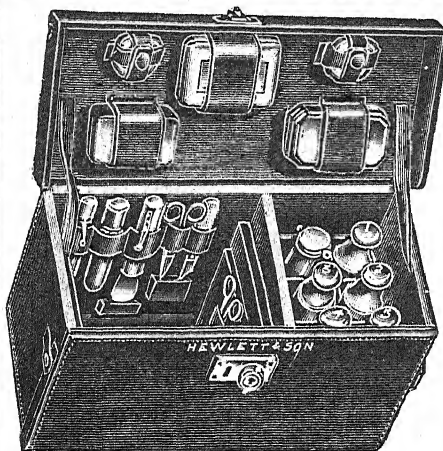
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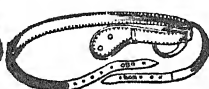
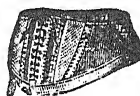
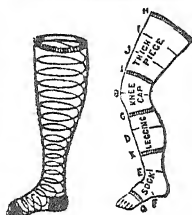
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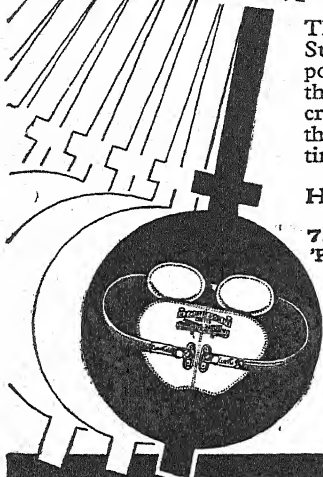
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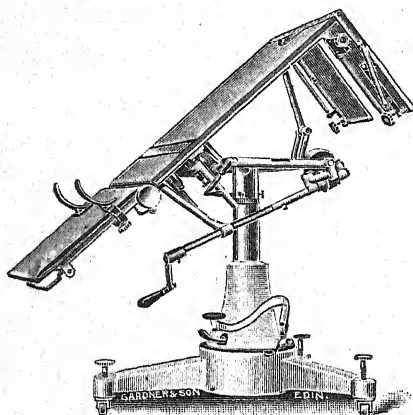
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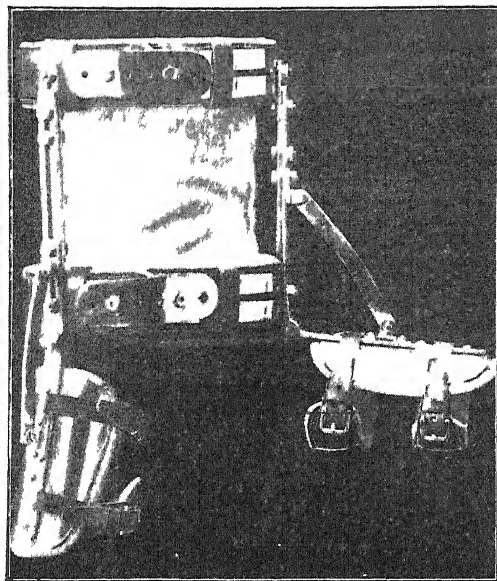
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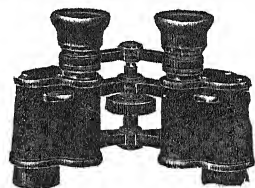


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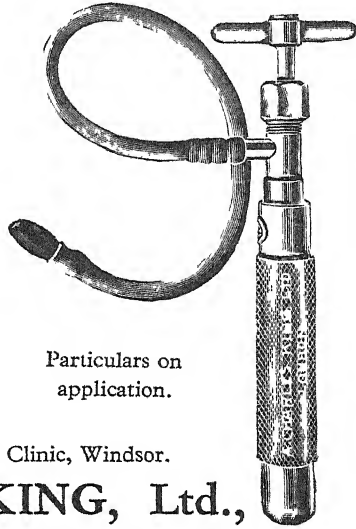
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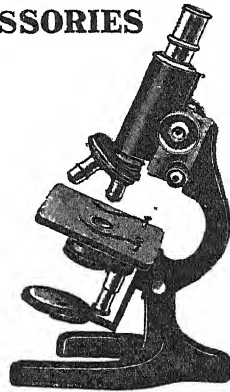
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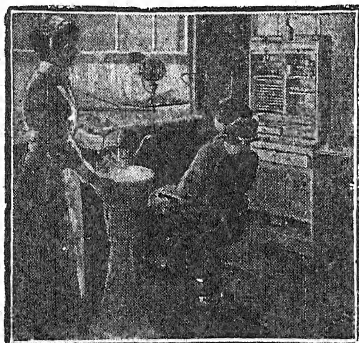
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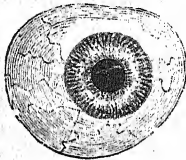
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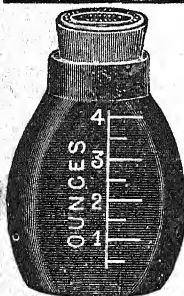
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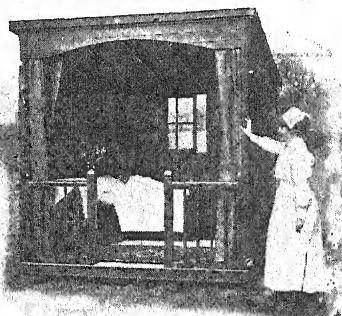
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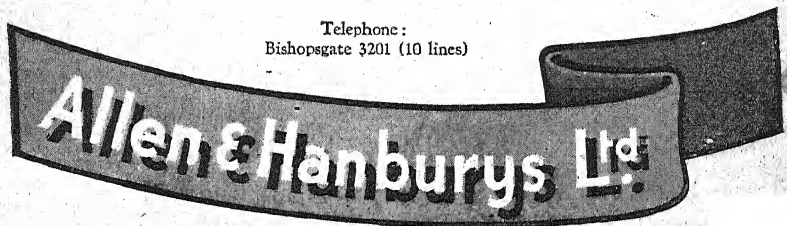
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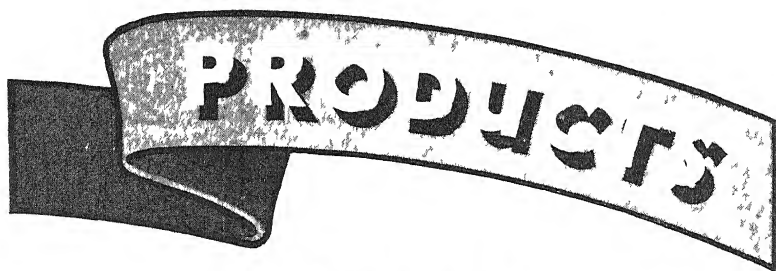
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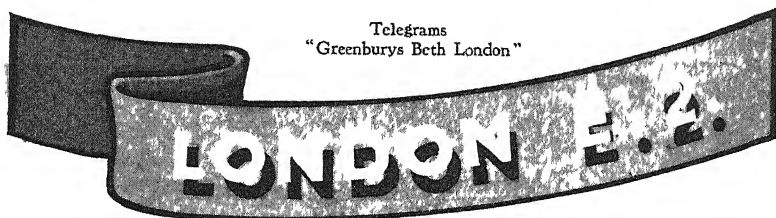
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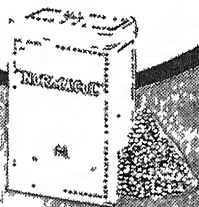
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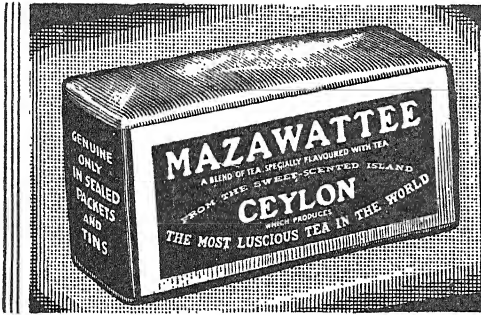
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